

Ship
Direction

noon - 4°32'S - 82°03'W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 10 AUG 67

Pg. # 1

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0900-1800

Wilson's
S.P.

200

Rel 3

1000's of pilot whales seen
throughout day - from ship to
horizon in all directions.
flying about surface particularly
in wake.

Cape Pigeon
(*Daption*
capense)

10

flying about ship $\frac{1}{2}$ in wake.

?

1

small grey bird - med. size - black wing
bars

Cape Pigeons

20

(throughout day 1 or 2 - 5 in a
group)

(Sooty S.P.)
~~Hornby's S.P.~~

2

O. markhami

Hornby's S.P.

1

Wilson's

2

Gadfly type

2

~~Petrel~~
Sooty Shearwater

Rel 3

more probably - Sooty Shearwater
maybe Kermadec Petrel? sitting on
surface - flying off as ship approached.

Sula
variegata

5

E-SE

individuals

Terns

2

NW

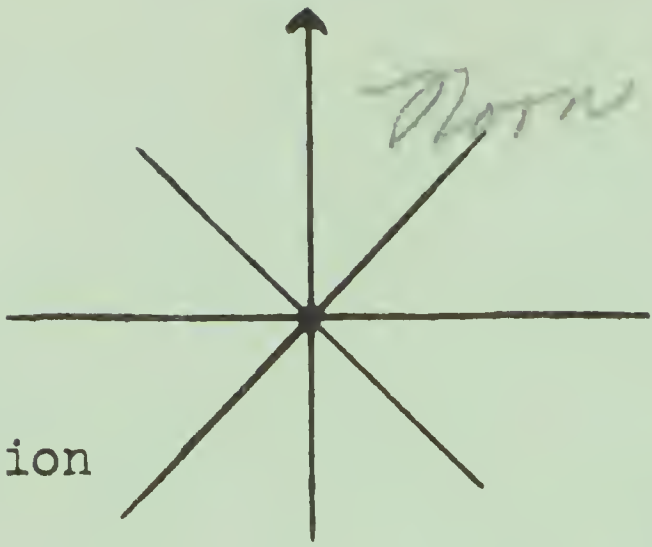
unid. - one grey upper parts, white
under; black capped head; other
same but w/ black band on upper
side wings

Brown Boobies 15

Group porpoises 600 yd off stern
moving SE.

260

5 HR OBS



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

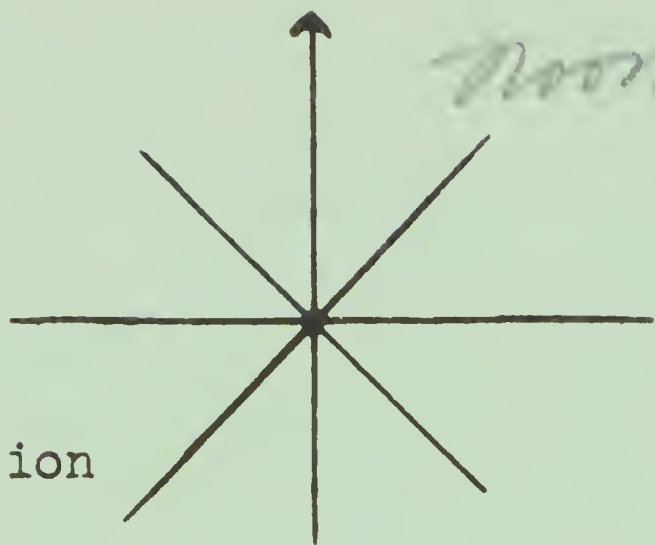
Date 11 AUG 67
Pg. #

SPECIMEN
or

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0900-1300	0.75 Rel 3				
	Heach's sp.	40	-		in wake or near ship - (25-200 yd)
	Wilson's sp.				
	Sooty Shearwater	Rel 3			KEEMADEC? SOOTY SHEARWATER
	GADFLY	10	-		flying about ship - especially in wake.
	PETRELS				
	Cape Pigeon	15	-		

2 HRS OBS

65



noon 10°09'S - 81°53'W

OBSERVERS:

Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 12 AUG 67
Pg. # _____

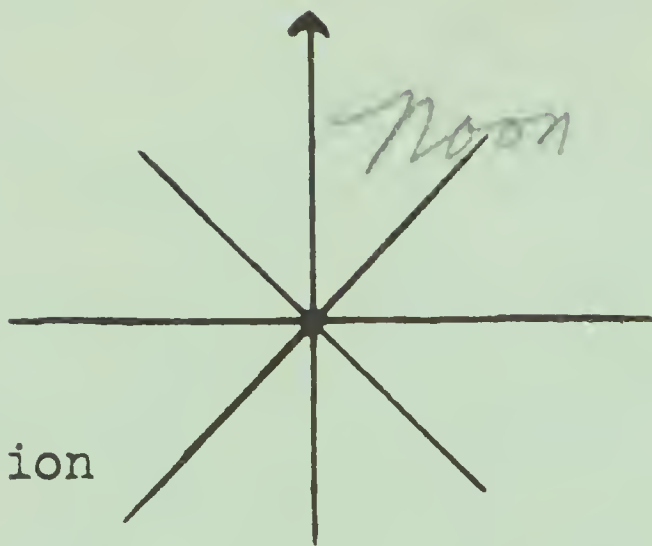
SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

1000	Cape Pigeon	5			on surface & in wake
1000-1015	Leach's Wilson's S.P.	10	Rel 3		in wake & about surface
1100	Dark GADGET Petrel	2	S-SE		SOOTY SHEARWATER - flying several hundred yards off
	Sooty Shearwater	Rel 3			
	Hornby's S.P.	3			flying about low
	Band	2			large white bellied - too far off to identify.

2 HR OBS

22



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

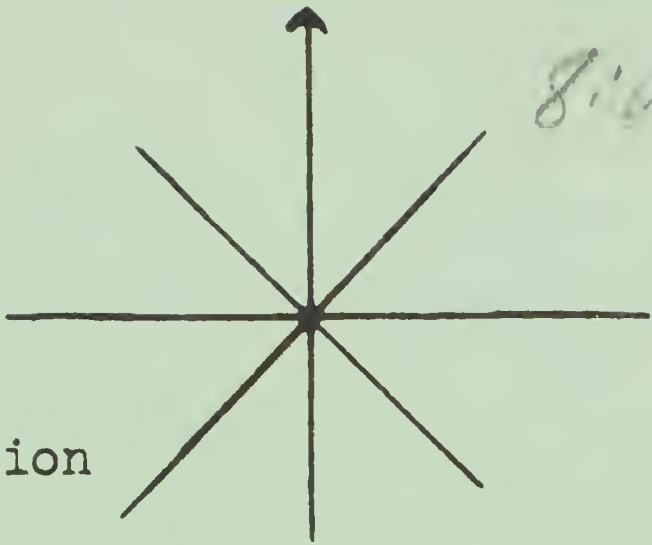
OBSERVERS:

Date 13 AUG 67
Pg.# _____

SPECIMEN
or

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0400	Cook's Pet	1			large grey-white; dark winged Petrel
0900	Wilson's S.P. ?	5	Rel 3		caught on deck --- Cook's Petrel --- flying about ship
	Sooty Shearwater	1	Rel 3		" " "
1200	Brown Booby	10	S		
	Wilson's ? S.P. & 10 total				Sooty Shearwaters not seen throughout day 5 total
		32			

2 HRS OBS



Ship
Direction

8:00 — 12° 02' S — 77° 15' W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date

14¹⁵ AUG 67

Pg. #

SPECIMEN

or

TIME SPECIES # DIR. BAND NO. REMARKS

In Callao Harbor

Common species

Peruvian Booby

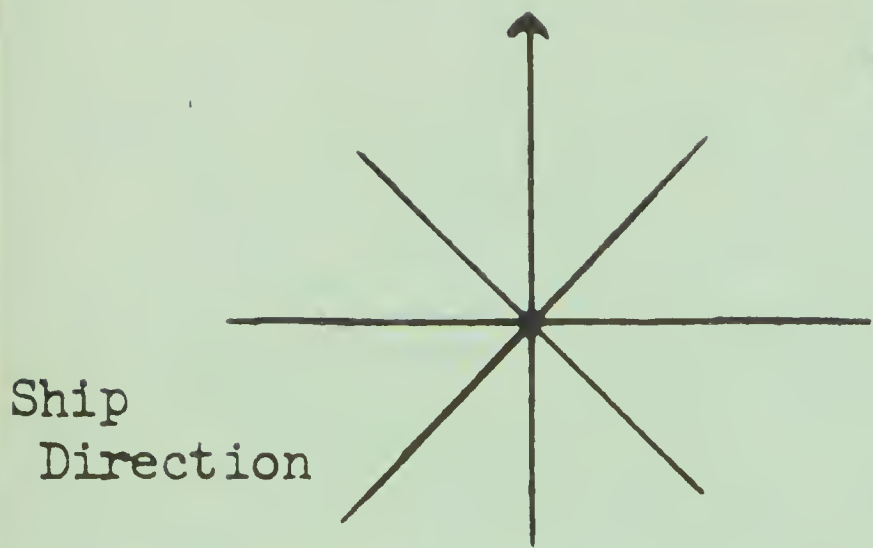
Laughing or Franklin's Gull

Wilson's S.P.

Sooty Shearwater

Chilean Pelicans

Not an ADP sheets



Ship
Direction

noon - 12°17'S - 77°40W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 16 AUG 67
Pg. # _____

SPECIMEN

moving or

TIME SPECIES # DIR. BAND NO. REMARKS

departed Callao - 1300

1300-1330 - on way to Sta 47124

Sooty Shearwater 75-100 - S-SW Rel 3

Gull (skittiwacked) 35 - S-SW

(Franklin's or laughing) Gulls 20 - following ship SW.

Rel 3 Wilson's SP. 30 - flittering about surface

Cape Pigeon 5

Jerns - 10 - SSE

common - but unidentified

1430 -

1445 Peruvian Booby 1 - SE

(Fulmer type) 1 - NE

Shear-Pet Terns 10 -

flew low over water - had to rise to fly over bow then descended once again

unid. all black-capped, grey above, white below - indivi. & in groups of 2 or 3

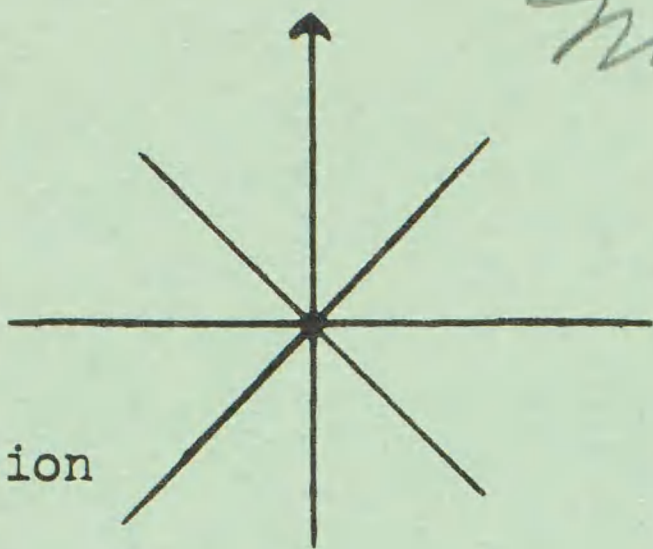
167-192

2 HR. OBS

Noon 12°59'S - 79°32'W

OBSERVERS:

Ship
Direction



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

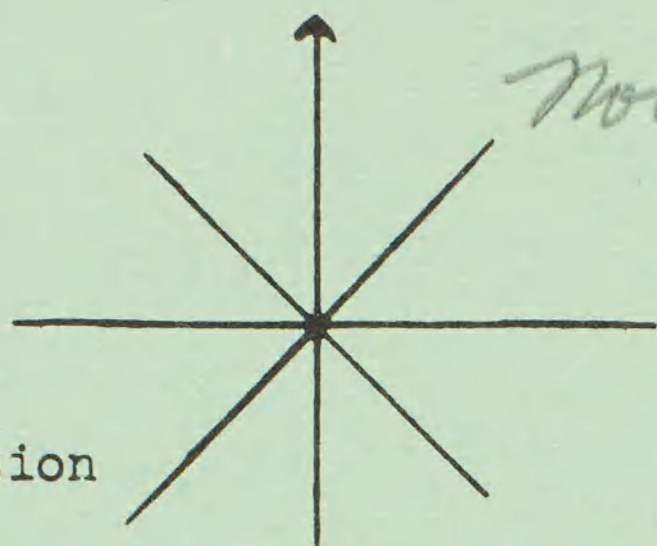
SPECIMEN
or

Date 17 AUG 67
Pg.# _____

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0630	Wilson's SP.	10	Rel 3		about ship
1200	Wilson's	15	Rel 3		school of porpoise moving SE
	Sooty Shearwaters	5	Rel 3		off stern
	Cape Pigeons	3			flying about surface 200-300 yds off.
					"

2 1/2 Hr. OBS
C

33



Ship
Direction

noon - 14° 04' S - 82° 43' W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

SPECIMEN
or

Date 18 AUG 67
Pg. # _____

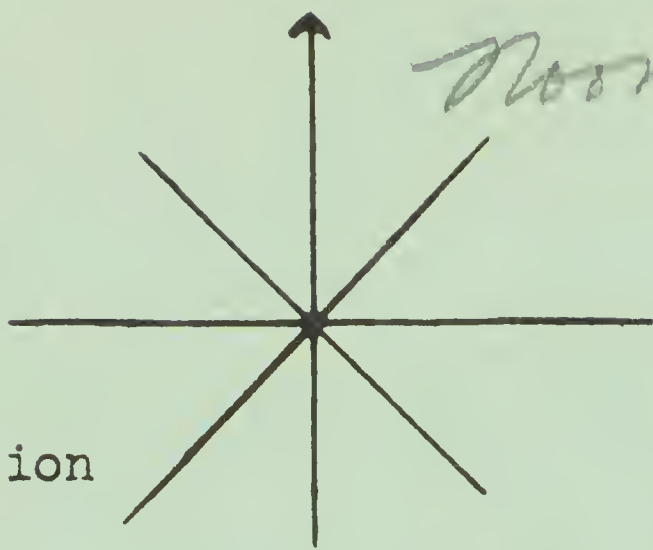
TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
1000-1100	Wilson's	2	Rel	3	
1315	(Bulwer's) → O. manihama	1	S		Rel 3
	(or Sooty SP)	1			
	Cape Pigeon	1			
	(Leach's SP)	1	E, SW?		flew past stern E, S.E.
	Oceanodroma				drizzle from S, S.E.
		(5)			

1 1/2 HRS OBS

Moore 14°43'5" - 85°01'W

OBSERVERS:

Ship
Direction



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

SPECIMEN
or

+6 Z
Times local

Date 19 AUG 67
Pg. #

TIME SPECIES # DIR. BAND NO. REMARKS

0400 Cape Pigeon 1

0910 (Blauvelt's or Sooty) 1

0950 Cape Pigeon 1
(Sooty S.P.) 1

White Bellied Storm Petrel 1

1000 Wilson's S.P. 1

1115 Cape Pigeon 3

White Bellied S.P. 1

Wilson's? (Leach's?) 1

O. markhami Sta 47151 - NE Rel 3

O. markhami Rel 3

Rel. 3

Rel 3

Rel 3

Rel 3

flew in arc of platform light
flying along swells.

from NW

Heading due North on 85
Parallel

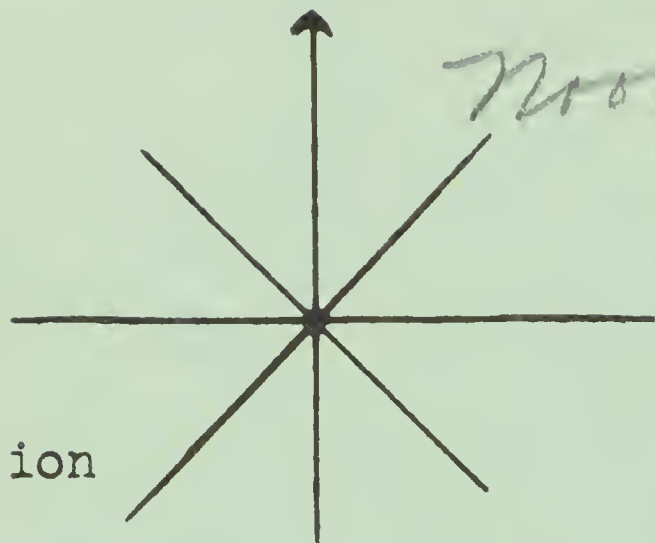
5 HRS OBS
C

(14)

noon - 14°43'S - 85°W

OBSERVERS:

Ship
Direction



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

SPECIMEN
or

Date 20 AUG 67
Pg. #

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0930	Leach's	10			about water around ship
	Sooty SP	1			
1100	Leach's	10			in wake
	O. markhami	1		Rel 3	
1130	Cape Pigeon	1			
1535	Wilson's	1		Rel 3	Mola mola - ocean sunfish (3')
1530	Leach's	5			off to west.
1600	S.P.	5			
1600	Leach's	8			in wake & about ship.
1630	Sooty SP.	1			off bow
	White Belly S.P.	1		Rel 3	
	L				

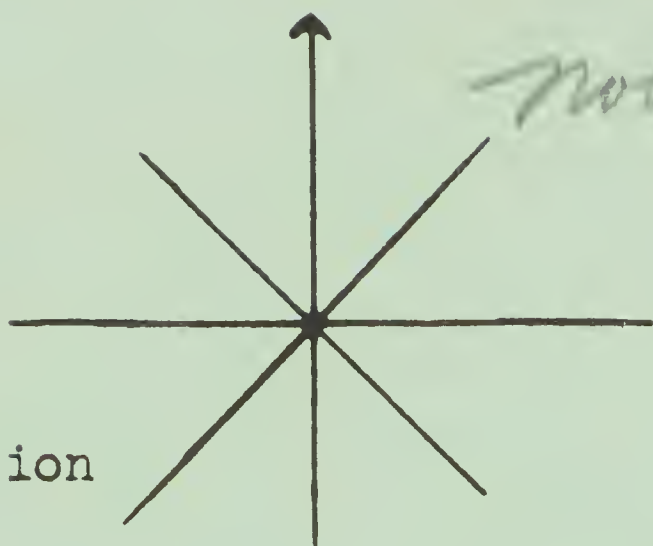
5 HR. OBS

39

7001 - 9°03'S - 85°08'W

OBSERVERS:

Ship
Direction



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

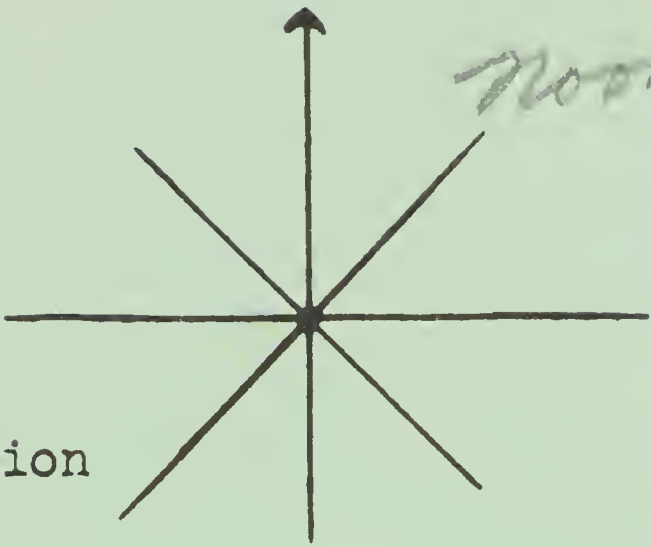
SPECIMEN
or

Date 21 AUG 67
Pg. # _____

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0645-0730	Atletia Procellaria	2	N		flew up from 1-2 mi astern 1 flew around ship then S. - finally flew behind. totally dark brown - with yellow cream bill.
	Pintado Petrel	5			
	Wilson's	1			
	(Heach's)	5			Oceanodroma
	White Belly SP	1			Red 3
	Horned Petrel	1			medium to large, grey upper, white under,
1100-1130	(Heach's)	10			Oceanodroma
	Pintado Petrel	3			in wake
	(Cape Pigeon)	2			
1415	(Heach's) SP	1			Oceanodroma in wake
	Cape Pigeon	2			

41

3 HR OBS



Ship
Direction

now 6°17'S - 85°25'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 22 AUG 67
Pg. # _____

SPECIMEN
or

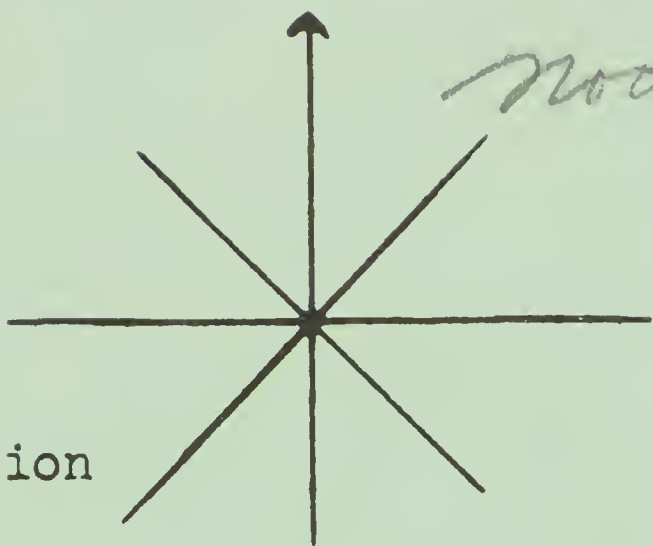
TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0700	Heach's	10			Oceanodroma
0720	S.P.				
	Cape Pigeon	1			
	White	2	Rel 3		
	Belly S.P.				
	Petrel	1			like Sooty S.P. too far off to identify
1000	Heach's	5			Oceanodroma
1130	Cape Pigeon	3			
	White belly	2	Rel 3		
	S.P.				

like Sooty S.P. too far off to identify

STA. 47177

1 HR OBS

(19)
(24)



Mon-03°43S - 85°01'W

OBSERVERS:

Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 23 AUG 67
Pg. #

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0930-1130 Wilson's S.P. 15 STA. 47189

(Leach's) 25 Oceanodroma

Cape Pigeon 1

(Sooty S.P.) 2 O. maculosa Pd 3

Hornby S.P. 2 - Pd 3

1400-1430

Cape Pigeon 5

Leach's 15
Wilson's

Albatross 1

- 1-2 mi away flying S.

1515-1530 Northern 9 DE

Phalarope

Hornby 1

5-10 feet above water flying W-DE
off bow - acted like flycatcher
in pursuit of insects - arcing
twisted - quick turning flight.

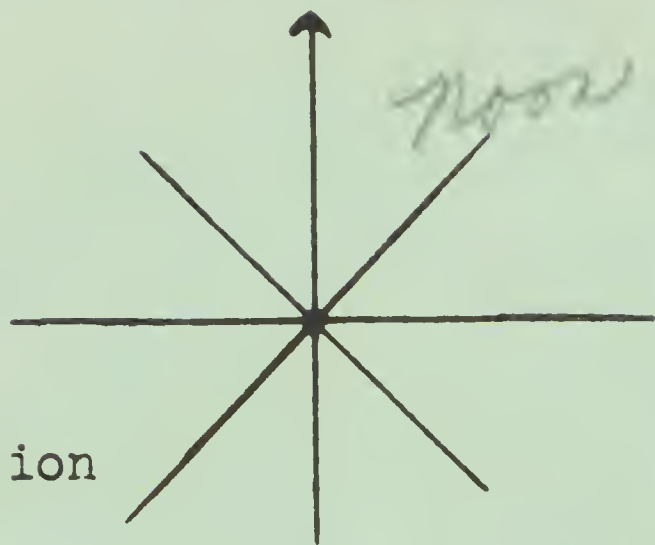
(76)

3 HR OBS

noon 0°32'S - 85°04'W

OBSERVERS:

Ship
Direction



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 24 AUG 1967
Pg. # _____

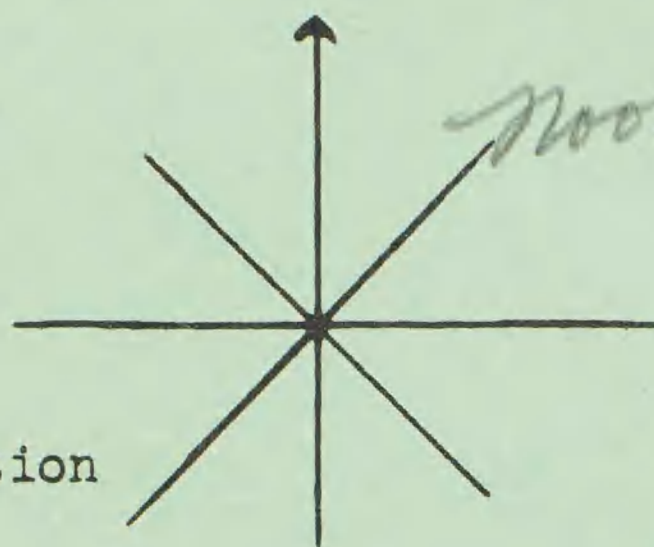
SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0545					Misty type rain - heavy overcast
0600	Wilson's or Leach's S.P.	1	SE	Oceanodroma	Shearwater type seemed to be chasing it northward - 300 yds off
0700	(Leach's)	1		Oceanodroma	
0710	SP	1		Oceanodroma	
0950	Leach's	1	NW		
1015	Frigate Bird Lesser?	1	S, SW.		Came from NW then circled above ship.
1020	Leach's	2		Oceanodroma	
1100	Frigate Bird	1			immature flew & circled over stem
1550	Frigate Bird	1			Soaring off to W. then over ship

8

2 1/2 HR. OBS



Ship
Direction

noon - $2^{\circ}17'N - 84^{\circ}57'W$

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

SPECIMEN
or

Date 25 AUG 67
Pg. # _____

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0655- 0710	Frigate Bird	8			7 immature, 1 off to W. soaring - after chasing each other - diving to surface & flying.
	Red footed Boobies	8	NE-SE		7 immature, 1 adult soaring & flying together.
	Storm Petrel	1			unid. - in sun.
0930	Frigate Birds	11	SE		soaring - one dove into sea
1015- 1040	Frigate Birds	4	SW		high - too far to identify
		2	SE		1 ♂ Great F.B. other ♀ Great flew across bow.
1300	(Leach's)	5			
1350	(Leach's)	1			
					Oceanodroma in wake

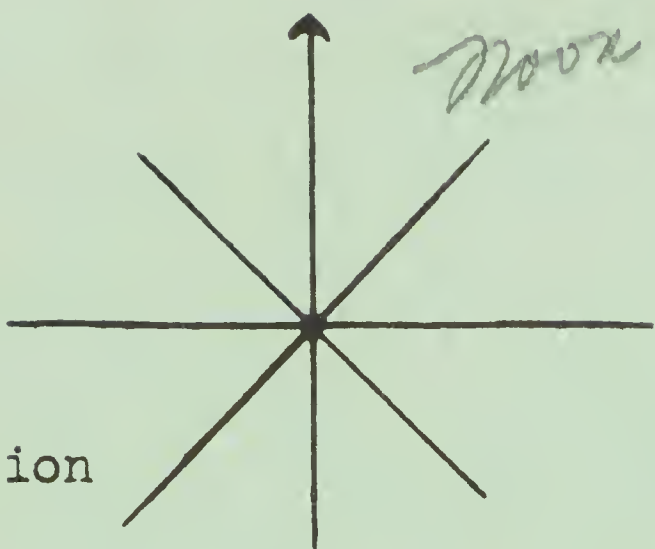
40

2 HR OBS

moon 5° 15' N - 84° 46' W

OBSERVERS:

Ship
Direction

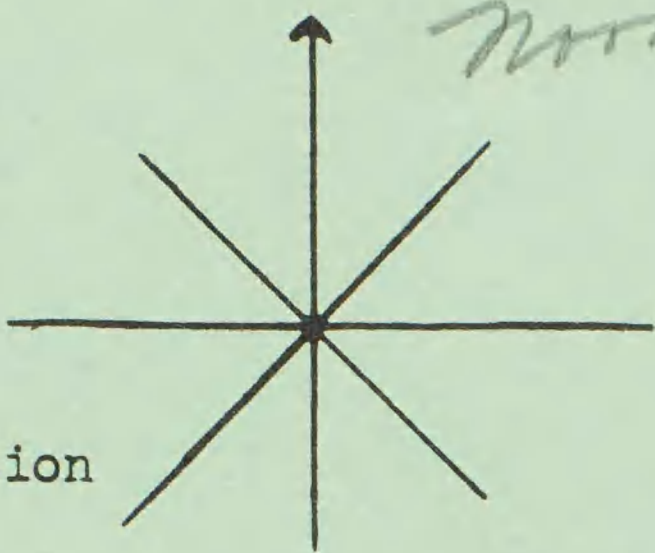


SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 26 AUG. 67
Pg. #

SPECIMEN
or

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0545	Frigate	1			soaring off to E.
0510-0530	bird				school of dolphin fish feeding on flying fish in platform light.
					2 6-8' silky sharks, <u>Carcharias longimanus</u>
1030-1115					8 Dolphin fish caught off stern.
	(Leach's SP)	10			indiv seen every so often throughout day.
	O. Tetras	Rel 3			1 shark caught during night.
		(11)			



Ship
Direction

07°52'N - 85°04'W

OBSERVERS:

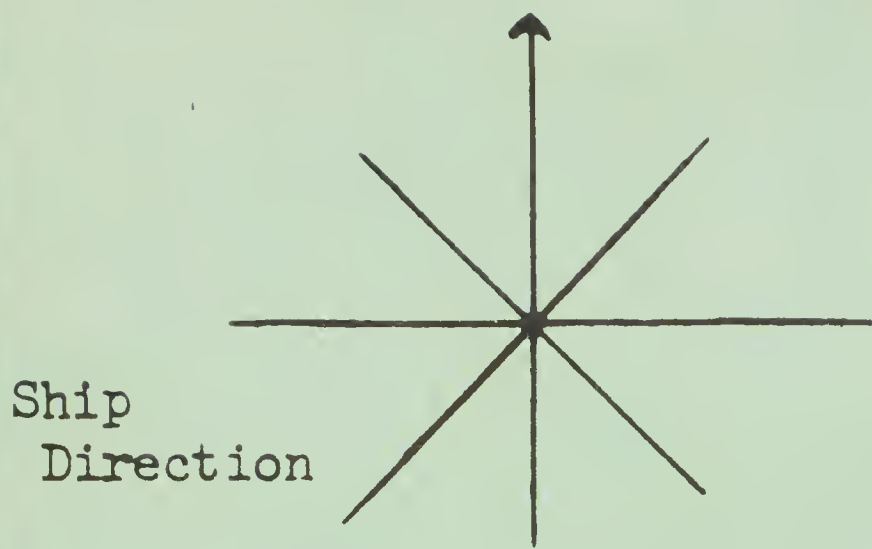
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 27 AUG 67
Pg. #

SPECIMEN
or

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0645	Storm Petrel (Wilson's or Leach's?)	2			Oceanodroma
	Brown Booby	1	E-W		
0845	(Sanderling or Sandpiper)	1			dead - floated by ship.
0850	Shorebird				school of skipjack tuna seen off to west; Green Turtle swam up to ship from 210°T then away to 280°-290°T in wake
0915	Leach SP.	25			200-300 yd SE. of ship
	Brown Booby	3			Skipjack Tuna off to west
0945					
	Brown Booby	1	W		
1000-1045	(Leach's? S.P.)	200 ± 25			floating in dense group on surface, some flying occasionally when ship closed then they scattered & disappeared.
	O. tellays Red	3			
1110		①			Marlin jumped 1 mi. S. of ship
1530-1545		①			5' shark swam around vessel -
	Snowy Egret	1	NE		came in from NE - circled ship then flew NE.
	Dark Boobies	①	small		green turtle passed ship
		2	NE, NE		each alone just above surface
		236			

4 HR OBS



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

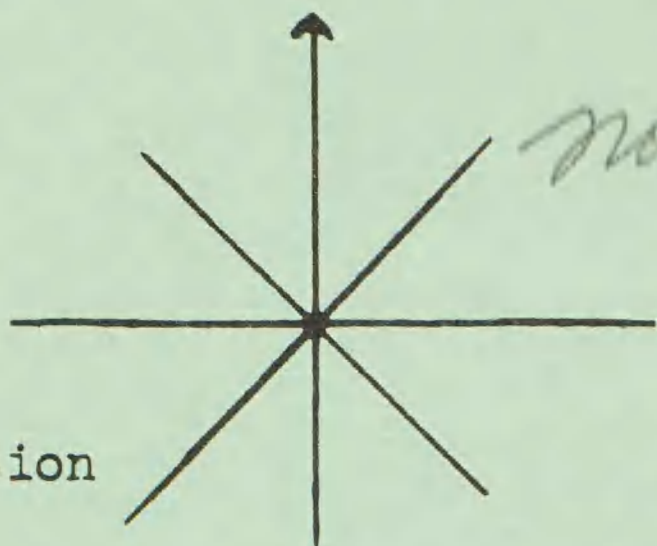
OBSERVERS:

Date 30 AUG 67
Pg. # _____

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

left Puntarenas - no obs.



Ship
Direction

noon 11°56'N - 88°26'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 31 AUG 67
Pg. # _____

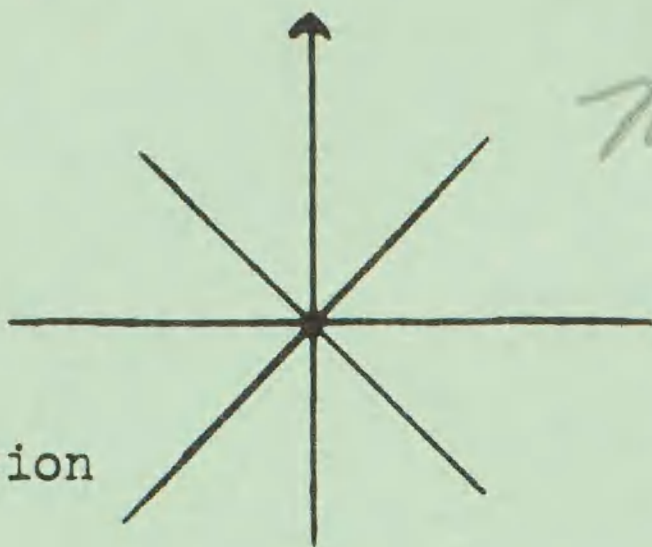
SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0630-0715	(Sooty SP) 4	Black SP Rel 3		in wake
0800	(Sooty SP) 3	Black SP Rel 3		" "
	(Leach's SP) 1	Oceanodroma		" "
0815-0900	(Sooty SP) 10	Black SP Rel 3		" " (probably those above at 0800 are some of same)
0830	Phalaropes 2			landing and taking off from water off to west.
1130-1230	FLYCATCHER 3			Wood Pewee or more likely Phoebe type. flying about ship & landing one caught - had tick on underside of bill - released - couldn't I.D.
1215	Sanderlings 2	Phalaropes	→ E	
1230	(Leach's SP) 1	O. t. sp. Rel 3		in wake
	(Sooty SP) 8			" "
	Black SP Rel 3			

5 1/2 HR. OBS

34



Ship
Direction

Noon 09°45'N - 88°13'W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 1 SEPT 67
Pg. #

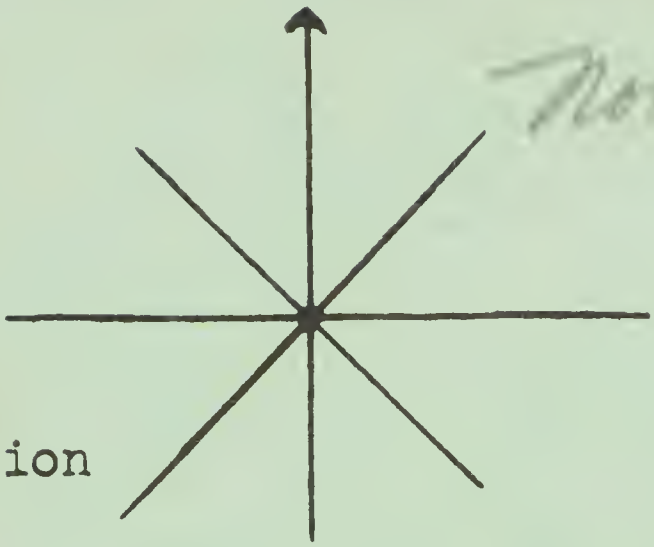
SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0700	Flycatcher	1			flying about ship
0930	(Leach's SP)	0.5		Rel 3	
	(Sooty SP)	2		Rel 3	in distance
1345	Red Footed Boobies	3	→ W, SW		flew close by ship
	(Wilson's or Leach's SP)	15		Oceanodroma	
1430	Phalarope	1			flew about ship then settled in water off to west - drifted aft.
1435	Blue Faced Booby	1	→ E, NE		
	Red Footed	4			
	(Sooty & Leach's SP)	10			common about surface of sea
	(Leach's SP)	15			
	Oceanodroma				
1500	Green	8			ranging from 1-3 feet - two copulating - drifted by → N
1600	Turtles				as we went S. most headed → N
	Oceanodroma				common about vessel
1720	(Leach's SP)	25			
	Red Footed Boobies	2			float alongside to west and move aft then fly up again

81

5 HR. OBS



Ship
Direction

noon 6°47'N - 87°57'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 2 SEPT 67
Pg. # 1

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0615-
0630

Brown
Booby

1

(Sooty SP)

1

Black SP R23

flew around ship
1/4 mi back in wake

1130-
1200

Red Footed
Booby

2

→ NW

(Sooty SP)

1

Black SP R23

in wake

(Leach's SP)

5

Oceanodroma

"

1200-
1300

Shallow

1

flying S. with ship - landed
aboard - then flew off alternately

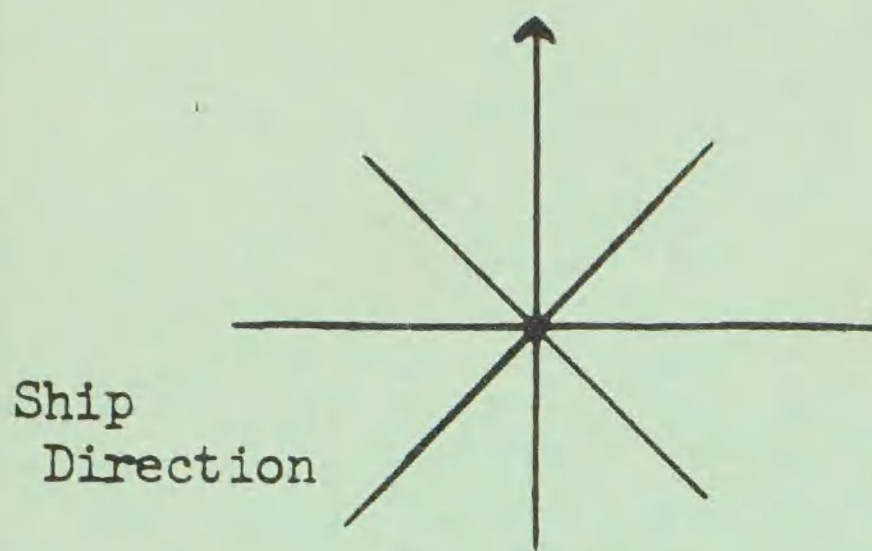
1415

"

2

2 1/2 HR OBS

13



05°04N - 87°25

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date Sept 3 1967
Pg. # _____

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

COCOS IS.

Throughout day - at Chatham Bay
Red footed Boobies: seen to leave the island at sunrise
0400 - 0700 → N. to W - 500 - 1000 ± a couple
thousand. One caught on ship during night
May have been Brown Boobies also but
overcast & low light level made ID difficult
in early hours.

♀ Great Frigate Birds in thousands - only
10-20 ♂ Frigates seen during day.
(Fairy)
White Terns common in trees & over
bays along island
Common Noddy also common on rocks - just
off shore (20-100 yds) & flying about

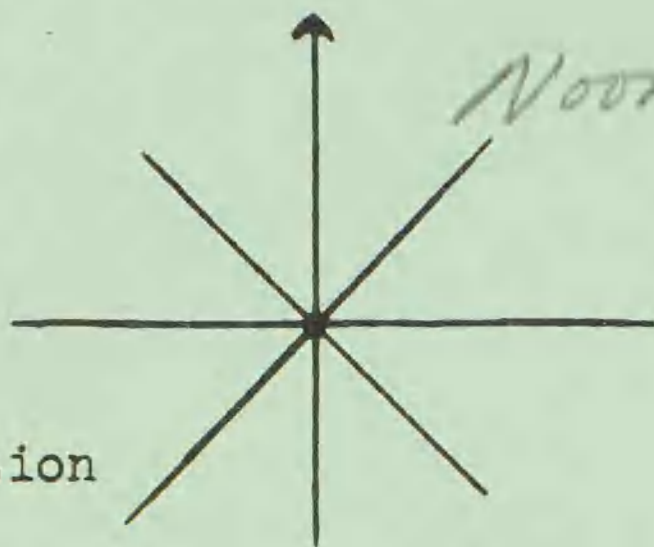
on shore - Whimbrel? ; Sandpipers seen
but no ID identified.

collected 2 Frigate Birds, 3 Common Noddy,
1 Fairy Tern with shot gun -
most in poor condition
1 Brown Booby shot from tree
disappeared on way back to
ship.

Noon 3° 15' N - 88° 04' W

OBSERVERS:

Ship
Direction



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

SPECIMEN
or

Date 4 SEPT
Pg. #

TIME SPECIES # DIR. BAND NO. REMARKS

0630 Frigate Birds 3
Red-footed Boobies 6
Jaegers, Parasitic? 10-15

1) Jaegers & Frigates in feeding flock - circling - Frigate - high. Boobies in separate group - circle - diving - to East

0645 Frigates 2
Red-footed Boobies 7
Jaegers 10

2) 2nd group of birds circling & feeding to East

0930 (Leach's SP) 1 Oceanodroma

Frigate B. 1

Soaring - high - 1-2 mi off to west

1030 Red-footed Booby 1 → N

1040 Frigate B. 1 → NE

♀ Great

1116 (Leach's SP) 1
Shearwater 1 Rel 3 → NW-N
Wedgetail? 1

arching over surface: dark except for white belly & white midstripe underside wings; neck sides brown, ~~white~~ - underside neck white
1 ♀ Great; 2 ♂ - followed ship south then flew off to NE. 4th Frigate joined up

1155 Frigate B. 3 → NE

1215 1

1215 Red-footed Booby 1 → E

all white bird glimpsed - disappeared in waves.

Rind 1
Sody's P. 1 S → N → NW

1400 Frigate B. 3

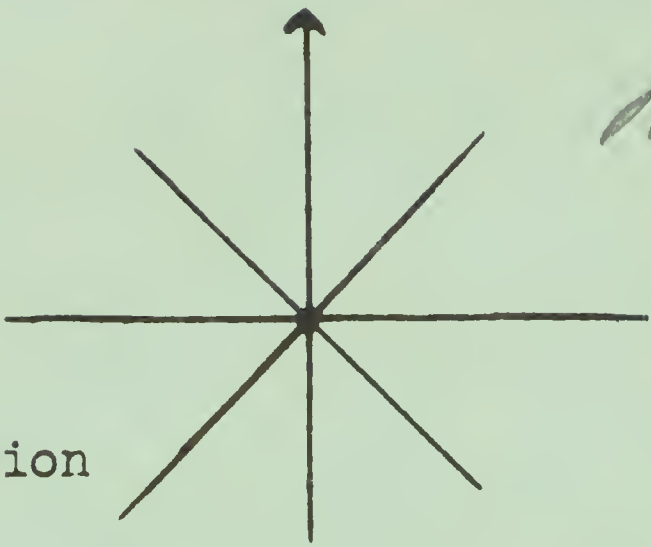
Red-footed Boobies 3

1415 Red-footed Boobies 2

off in distance. 1/2 - 1 mile

49

6 HR OBS



Ship
Direction

NOTED $0^{\circ}22'N - 88^{\circ}02'W$

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

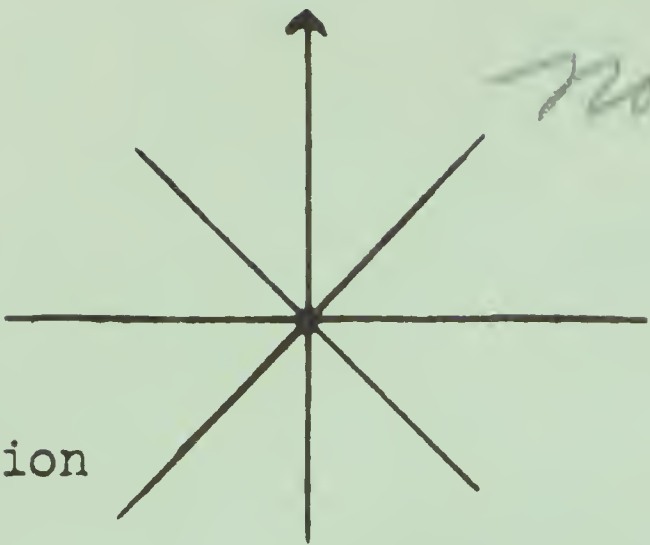
Date 5 SEPT 67
Pg. # _____

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

	Red Tailed Booby	(1 shot 4)			caught on deck during night
0930	Shearwater Wedgetail?	1	Red 3 BW		like one seen on 4th
1130	(Leach's SP.) Oceanodroma	2			off stern
		(4)			

HR OBS



Ship
Direction

Lat 02° 31' S - 88° 02' W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 6 SEPT 67

Pg. #

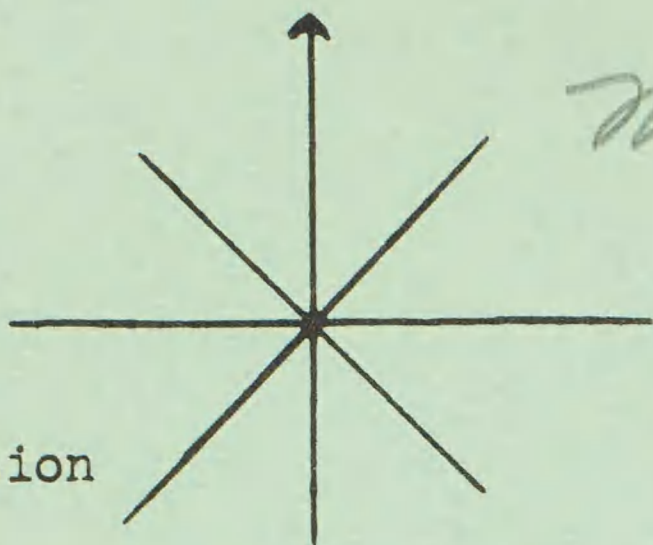
SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0710-0730	(Sooty SP)	1	DS	Rel 3
	(Leach's SP)	1	DS	Oceanodroma
	Shearwater Wedgetail?	1	DS	Rel 3
	Cape Pigeon	1	DS	
	Northern Phalaropes	2	DS	
0800	Northern? Phalaropes	2	DS	

9

1/2 HR OBS



Ship
Direction

noon 8°16'5 - 88°03'W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 8 SEPT 67
Pg. # 1

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0650 ^{Stamp at}
Hornbys S.P. 1 → N

Leach's S.P. 1 → N

0930 ^{Oceanodroma}
Cape Pigeon 1

Leach's S.P. 10

1100 ^{Oceanodroma}
Cape Pigeon 1

Leach's S.P. 10

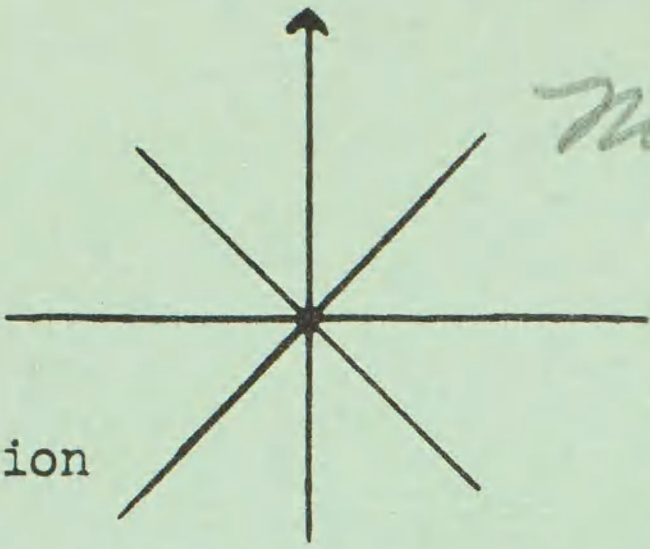
Oceanodroma

off fantail

" "

1 1/2 HR OBS

(24)



Ship
Direction

Noon - 11°18'5"-87°59'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 9 SEPT 67
Pg. # _____

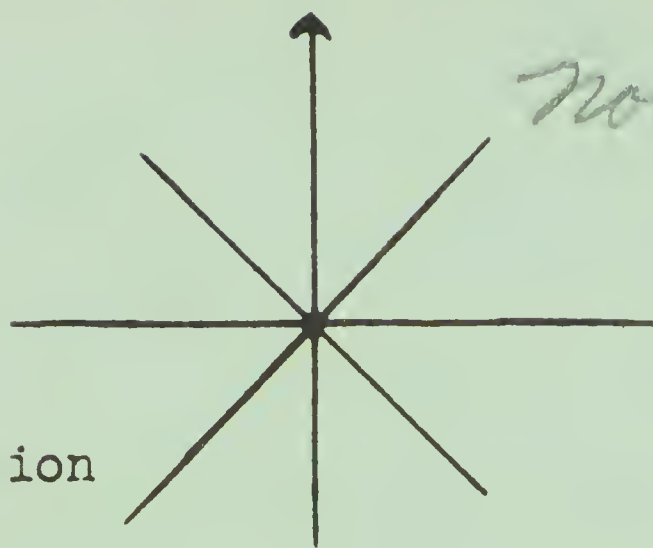
SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0615	Sooty or Green-backed Butcherb. 1	1	SW		too far away to IDEN.
0640	Hornby's sp. 1	1			landed near wake
0900	Cape Pigeon 1	1			landed to west
1030	Cape Pigeon 1	1			maybe same as above - sta 47369
1100	Pilot Whales 20±5				to North

4

2 HR OBS



noon 14° 02' S - 87° 57' W

OBSERVERS:

Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 10 SEPT 67
Pg. #

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

1000 Cape Pigeon

1

1355 Bulwers or
Sooty S.P.

1

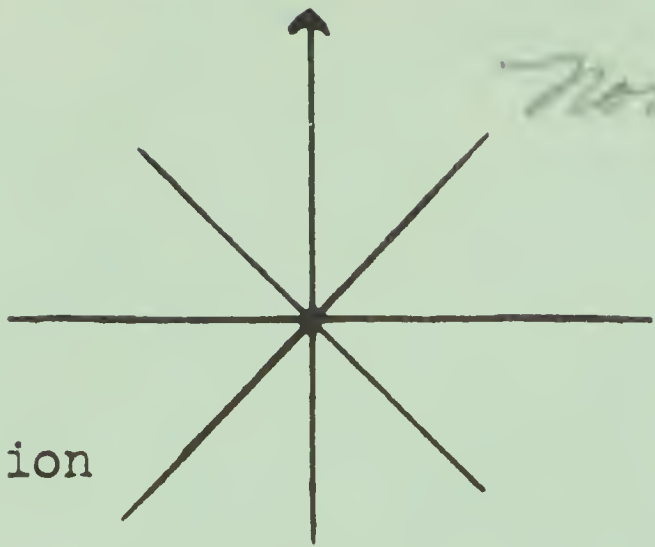
→ S-SE.

Oceanodroma

STRONG WINDS

1/2 HR. OBS

(2)



noon 14°57'S - 91°40'W

OBSERVERS:

Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 11 SEPT 67
Pg. #

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

1400

White
Throated SP.

1

DE

Rel 3

~~HIGH~~ 35 KNOT WINDS

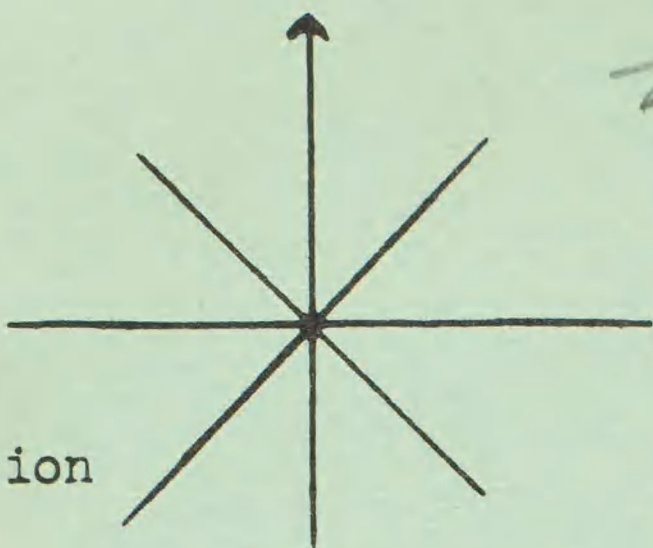
NO OBS

(1)

Worm 14° 16' S - 95° 07' W

OBSERVERS:

Ship
Direction



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

SPECIMEN
or

Date 12 SEPT 67
Pg. # _____

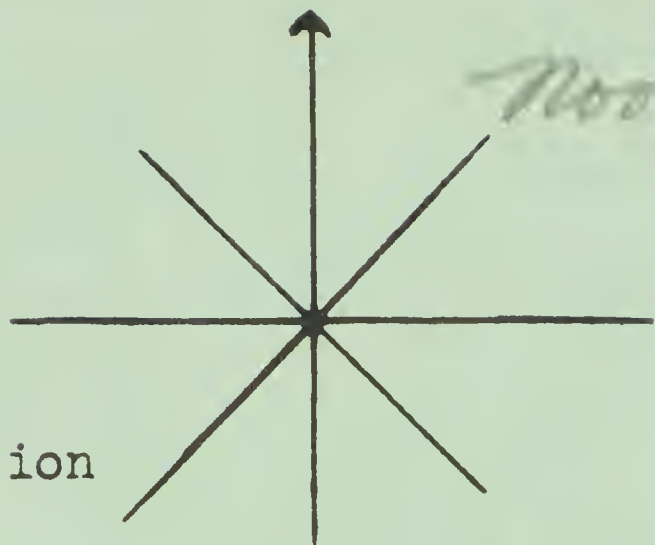
TIME SPECIES # DIR. BAND NO. REMARKS

1030 IMMATURE Booby ~~species~~ 1
BLUE EARED landed on sea, flew about ship

1100 Cape Pigeon 2 ~~DN~~ off stern

1/2 HR

(3)



noon 10° 45' S - 95° 03' W

OBSERVERS:

Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 13 SEPT 67
Pg. # _____

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

1000 Cape Pigeon 2

(Sooty S.P.
or
Bulwer's)

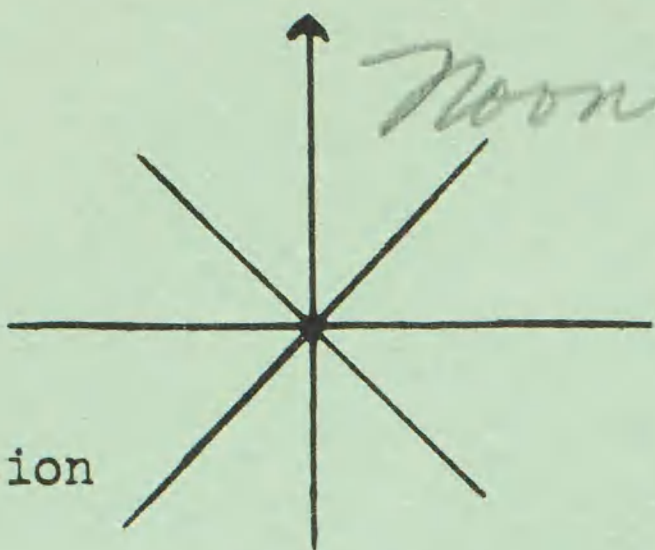
1

200 yd out off stern

Oceanodroma

(3)

1/2 HR OBS



noon 07°32S - 95°00W

OBSERVERS:

Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 14 SEPT 67
Pg. #

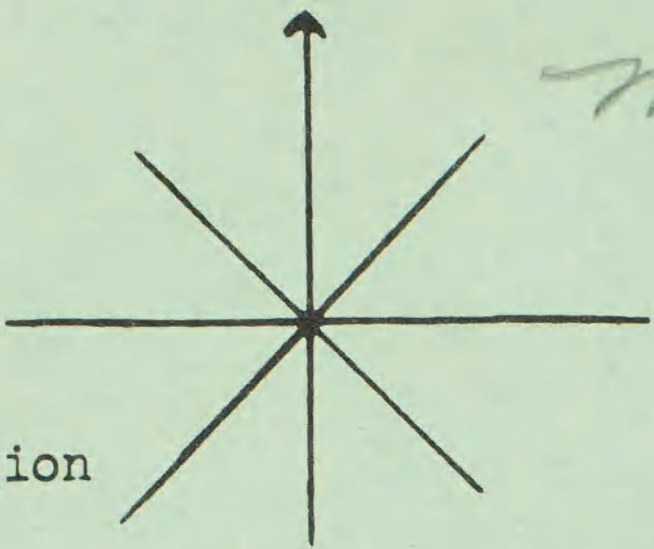
SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0845	Frigate Bird	1			slowly circling to North
0910	Wedgetail?				
	Shearwater	1	DN	Rel 3	

1 1/2 HR OBS

(2)



Ship
Direction

noon 8°45'S - 95°01'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 15 SEPT 67

Pg. # _____

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0830 Cape Pigeon

1

1300

(Hornby's S.P.)

1

Storm Petrel

Leach's S.P.

1

Oceanodroma

1320

Sooty S.P.

1

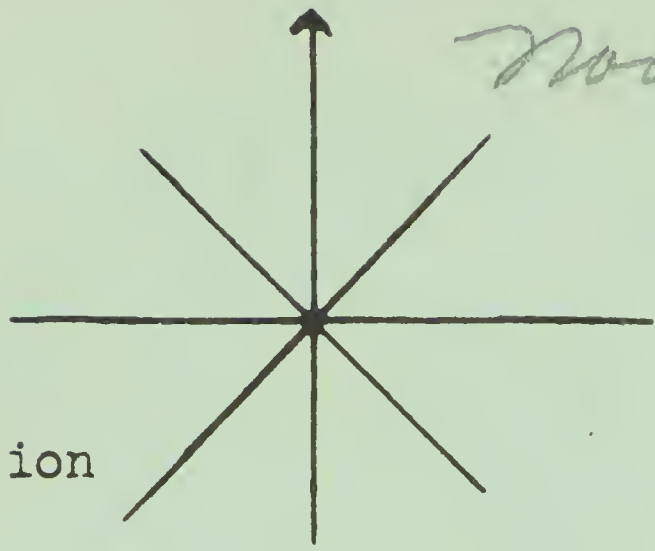
→ S.

or Bulwer's

Oceanodroma

(4)

2 1/2 HR OBS



Ship
Direction

noon 05°51'S - 95°09'W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

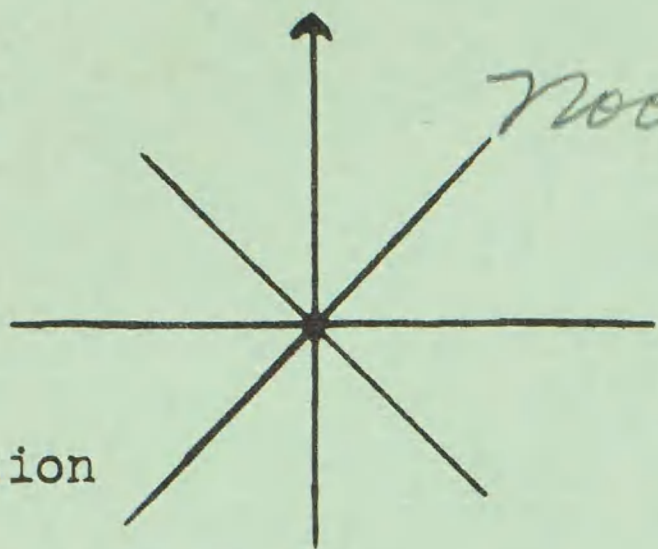
SPECIMEN

or

Date 16 SEPT 67

Pg.#

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0800	FRIGATE B.	1			Hovering 5-10' over water - as if watching school of fish.
0915	Wedgetail? Shearwater	1	DS	Rel 3	
1410	(Hornby's) Storm Petrel	2			flying in small circles - one dipping bill in water then flying a few yards dipping bill etc 6 or 7 times
1600	(Hornby's S.P.) Storm Petrel	1			dipping bill as above - "walked" on surface -
1630	(Leach's S.P.) Oceanodroma	10			above flying randomly about surface.
		(6)			<u>2 HR OBS</u>



Noon 02° 31 S - 95° 01' W

OBSERVERS:

Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 17 SEPT 67
Pg. # _____

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0930 (Leach's S.P.) 3 Oceanodroma

Cape Pigeon 1

1125 " " 1 Oceanodroma

(Leach's S.P.) 5

Booby 1

to for off to IDEN.

1240 (Sooty S.P.) 2 Oceanodroma

(Leach's S.P.) 3 Oceanodroma

Northern?

Phalaropes 3

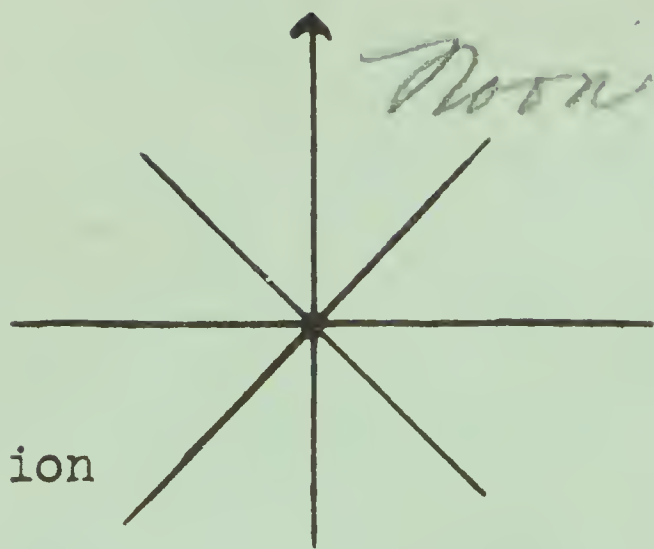
2-3

circling

"dropped out of sky" 10-15 feet to land on water.

18

2 HR OBS



North 0°23'N - 95°06W

Ship
Direction

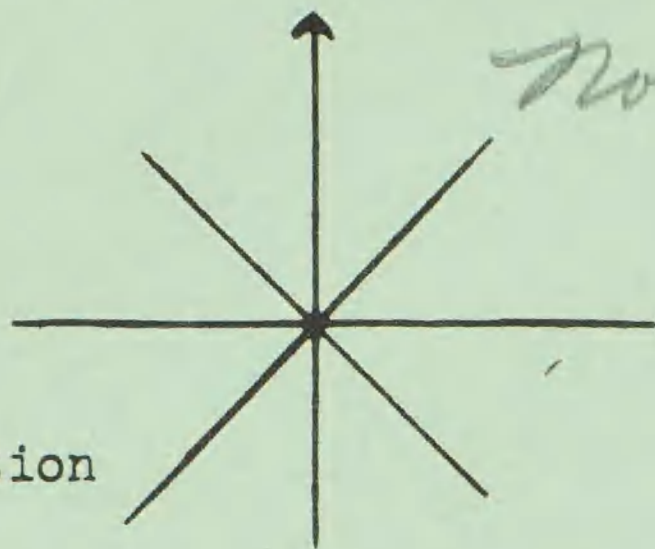
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

SPECIMEN
or

Date 18 SEPT 67
Pg. #

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0630	Leach's SP.	1			
0815	Leach's SP.	2			
1030	Leach's SP.	5			STA. 47474
	GULL	1	→ SE		
	Tern (Large Crested or Caspian or Royal)	1	→ SE		deeply forked tail, black cap, grey upper side of wings; white under side
1410	Leach's SP.	2			
	Petrel	3	E-W		size of sooty SP - heavier body; strong rapid wing beats, dark rump, dark above, white below, Petrel like - BOWN'S? except base of bill - forehead appeared dark.
		15			
					1½ HR OBS



Ship
Direction

Noon - 3° 25' N - 94° 46' W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 19 SEPT 67
Pg. #

SPECIMEN

or

TIME SPECIES # DIR. BAND NO. REMARKS

0800-1000 (Leach's SP.) 10-15
Oceanodroma

passed individ & groups of 2-3.

1215-1220 Frigate Birds 100 ± 10
Red-footed Boobies 50-60

feeding flock; most ♀ Great F.B.
a few of the Frigates were chasing some of the Red-footed Boobies
2 groups of Boobies in water 20-30 in each - only a few were flying
about 10-15 Boobies in light phase.

1235 Shearwaters 2 } Pitul
(Wedgetail) } 1 → SE
 1 → NE-N

then landed; underside of wing white outer part - inner 1/2 with white diagonal stripe
rest of body dark

Sterna Pitul
(Hornby's S.P.) 1 → SE

1705 Shearwaters 2

dark in color - no linco's - looked like above though = 200 yd off

1730 Red-footed Boobies 6 → W

171-186

3 1/2 HRS OBS



Ship
Direction

noon 6°34'N-94°52'W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

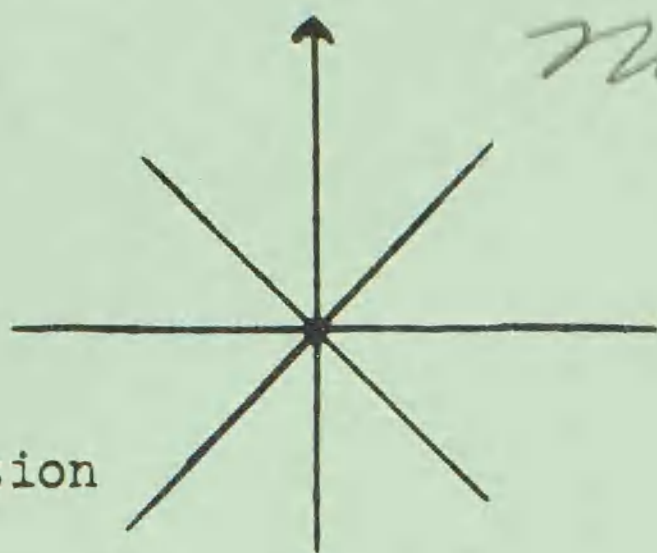
Date 20 SEPT 67
Pg. #

SPECIMEN
or

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0600	FRIGATE BIRD	1			soaring overhead
1000	WARBLER	1	→ E		
1000-1200	Leach's SP.	5			indiv. seen occasionally
	<i>Oceanodroma</i>				
1150	Tern sp.	1	→ S		
	<i>Oceanodroma</i>				
1600	Leach's S.P.	2			
	Shearwater	1	→ N		MAYBE NEW ZEALAND
1820	(Howby's SP.)	2	→ S-SW		
	Shearwater	1			MAYBE NEW ZEALAND

(14)

3 1/4 HR OBS



Ship
Direction

noon 10° 21' N - 95° 04' W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

SPECIMEN

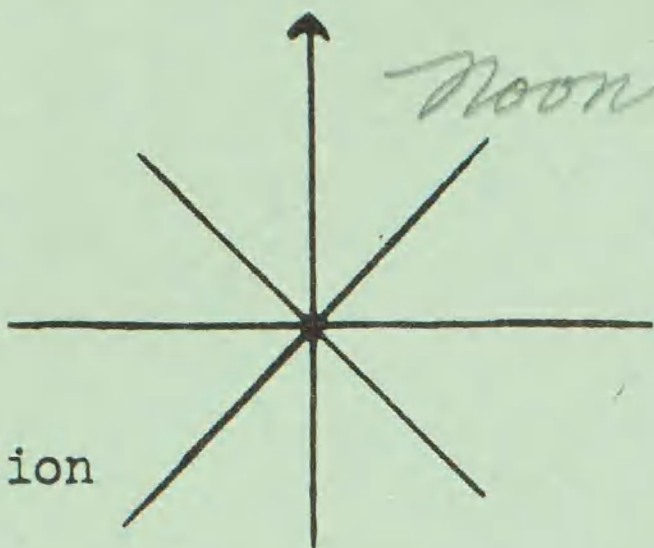
or

Date 21 SEPT 67

Pg. #

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0800	Leach's SP	15			indiv - when stopped grouped up
1000	Oceanodroma	8			off stern STA 47513
0900	SOOTY SP	2	→ SE		in wake
0920	FLYCATCHER	2	→ SE		landed aboard then off to SE. (EASTERN KINGBIRD)
1020	NORTHERN PHALAROPE	1	→ N, NE		
		5	→ E		FLYING ABOUT 30-50 ft off water
		2	→ SW		
1120	BLUE FACED BOOBY	1	→ N		ADULT, 102 ft off water
1125	School of MACKEREL				surface feeding
1325	Leach's SP	2	→ S		
	Oceanodroma				School of fish feeding on surface
1335	NORTHERN PHALAROPE	1	→ S, SE		flew over ship; have heard the same chirping sound before - but have not seen birds - also heard it at times during night.
1345	BLUE FACED BOOBY	1	→ SSE		
1400	RED FOOTED BOOBY	1	→ SSE		flew over ship; circled 2 times
1435	NORTHERN PHALAROPES	9	→ NW		one group w/ 5; two w/ 2, STA. 47515
	TERN, LEAST?	1	NW → SW		mackerel? feeding; then circled - dove into water about 12 times - circled
	Red Footed Booby	1	→ SW		flew off to SE. 1500 Tern back again feeding.
1500	NORTHERN PHALAROPE	2			1 on surface, 1 flying about
	Black SP Rel 3.				
	(SOOTY) SP.	1			
	(Leach's)	12			
	Oceanodroma				
1535	School of fish				surface feeding
	Tern	1	→ S		
	BLUE FACED BOOBY	1	→ NW		
1845	BROWN BOOBY	1			ATTEMPTED TO LAND ON FOREMAST

5 HRS OBS



noon 13°34'N-98°01'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Ship
Direction

SPECIMEN
or

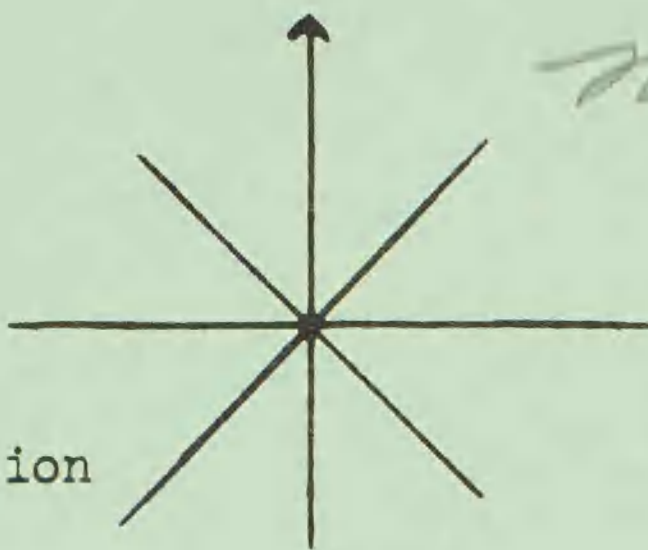
Date 22 SEPT 67
Pg. # _____

TIME SPECIES # DIR. BAND NO. REMARKS

0600	BROWN BOOBY	1			ON FORECAST ABOVE RADAR : STAYED THERE OVERNIGHT?
0645	BROWN "	2			flew around ship - one on mast joined them.
0710	BROWN "	8			
0730	NORTHERN PHALAROPE	45			flying about & sitting on water
0810	BOOBY	1			white - too far off to IDEN.
	STORM PETREL	1			like beach's except no white rump
	school of fish				completely dark.
					(Skipjack Tuna?) jumping 200-300 yds.
1045	(beach's SP Oceanodroma)	1			in wake
	BLUE FACED BOOBY	1			
	Black (SOOTY) S.P.	1	SE		
1145	BLUE FACED BOOBY	1	SE, SW		
	MARLIN	1			
	GREEN TURTLE	1			
	BROWN BOOBY	4	SE		
1230	BROWN BOOBY	5			
1300	(SANDPIPER) Phalarope	1	NW		flew around ship 3 times then NW
1330	BLUE FACED BOOBY	1	N, NE		
1335	" "	3	E		FISHING BUOYS - LONG LINERS ? SIGHTED
1500-1700	" "	10	S		GROUPS of 2, 3 & indivi
1815	(DUNLIN?) SANDPIPER Phalarope	1			like sandpiper seen earlier. On surface, flew up - then back to surface.

87

5 HR OBS



Ship
Direction

noon 13°54'N - 91°35'W

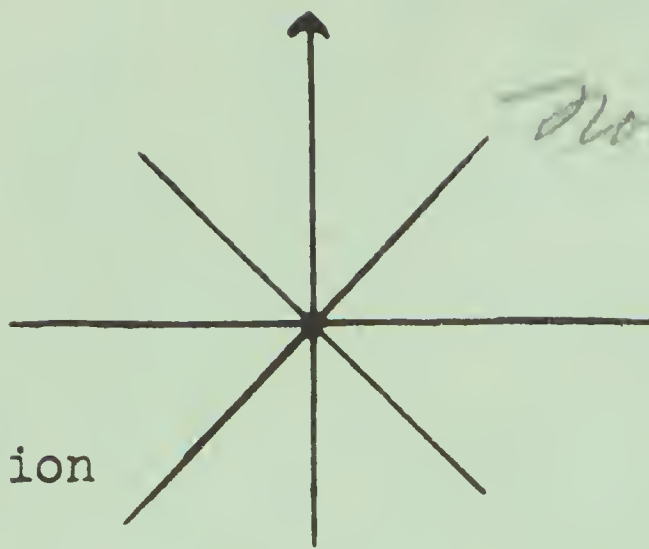
OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

SPECIMEN
or

Date 23 SEPT 67
Pg. # 1

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0720-0800	SPOTTED PORPOISES	15-20			off to NE - under bow - in front of bow
	WHITE-BELLIED PORPOISE	1			a) REMORA TYPE FISH - in front of bow
	PORPOISE	1			UNID. " " " "
0740	DUNLIN? ^{Sanderling}	1	ON		
	TYPE SANDPAPER	1	ON		
	BROWN BOOBY	1	NE		
	BLUE FACED BOOBY	5			1 IMMATURE
	MANN				
	NEWELL'S				
	SHEARWATER	10	DE		
	BLACK LEAST TERN	2	DE		
1100-1130	FRIGATES	10			circling; very green water - many dead coral & freshwater plants much dead plankton under "rafts" of debris
	Dolphin fish	2			
	Wilson's?	29			
	Northern Phalaropes	15-20			in midst of & around "rafts" of debris - on surface
	BLUE FACED BOOBIES	20-25			on logs that float by - 1-5/log
1430	Sea Snakes	2			Can see land -
1525-1600	BLUE-FACED BOOBY	10			common - few flying
	BROWN BOOBY	4			2 immature around & on logs
	Northern PHALAROPES	15			2 small groups flying
	Porpoises	2			small black - jumping
	Spotted "	2			in front of bow
	Terns - least	8			3 species 1 least?; 2 - charcoal wings, dirty grey belly w/ eye stripe; 5 - too far to IDEN. - Grey upper - dark wing margins
		101-111			
		10-20 miles off shore "most of day"			
				3 HRS	



Ship
Direction

noon 13° 15' W - 87° 48' W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 24 SEPT 67
Pg. # _____

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

0600

0730

Brown Pelicans
Frigate Birds

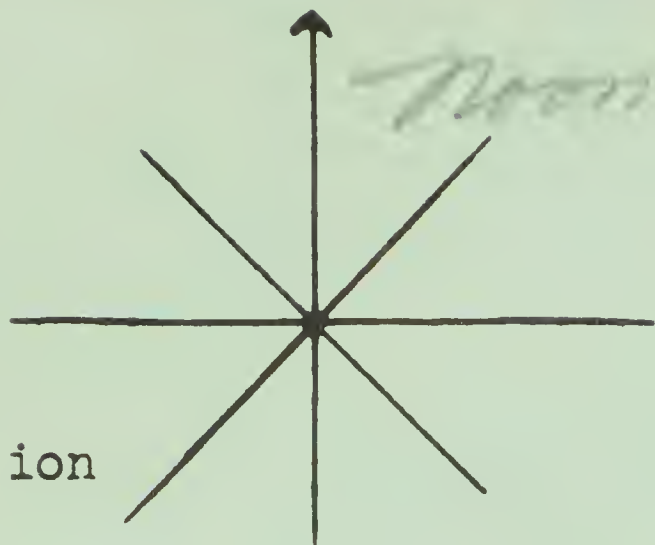
3

15

off La Union

in Bay near La Union - no gulls seen - only
Pelicans & frigate birds most of which are ~~Edgell's~~
on shore Willets; sandpiper.

18



Ship
Direction

noon - 12° 09' N - 87° 17' W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

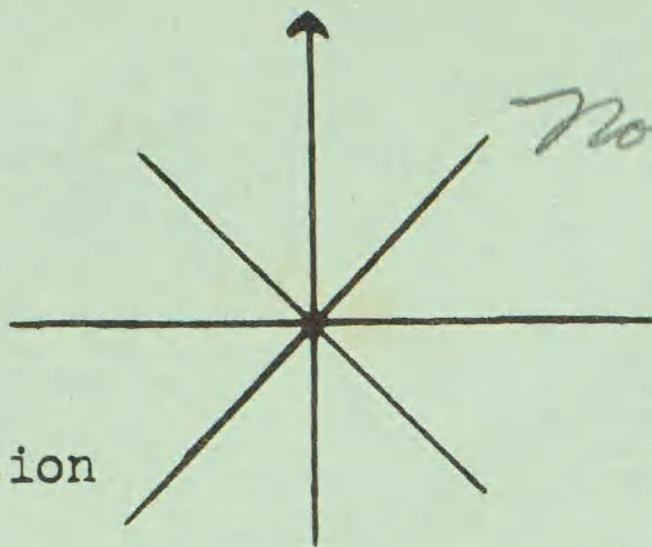
SPECIMEN

or

Date 27 SEPT 67

Pg. #

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0700 0815	Brown Pelicans	200			Departed La Union for PANAMA ON water ; 20 ± 10 flying & landing
	Frigates	15	common		
0900	Tern	1			
1050 1100	(Green) Turtles	8			1 every 200-300 yards
	Brown Boobies	10			
	BLUE-FACED BOOBY	1			
		227			
					1 HR OBS



Ship
Direction

Noon 7°36'N - 82°52'W

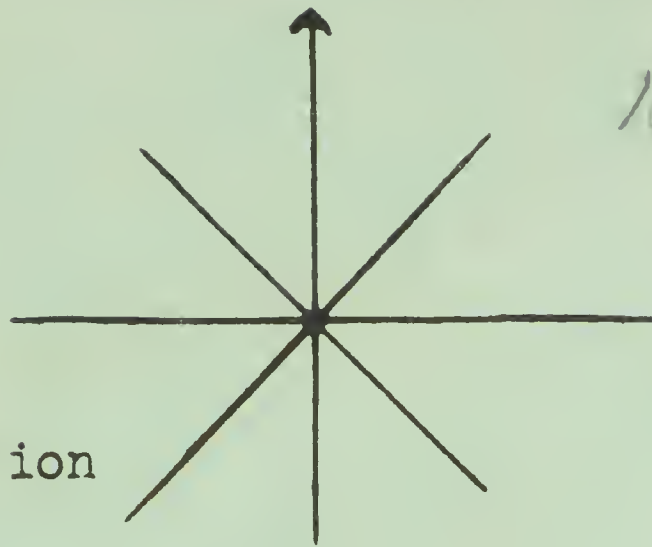
OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 28 SEPT 67
Pg. # 1

SPECIMEN
or

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0600	Many NEWELL'S SHEARWATER	2			
0630	Ducks	8	SE		to far off to IDEN.
0730- 0745	Many NEWELL'S SHEARWATERS	25-30			feeding flock -
0800	BROWN BOOBY	2			
		37-42			1 HR OBS



Ship
Direction

1200 - 05° 55' N 78° 05' W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 1 AUG 67

Pg. #

SPECIMEN

+ 5 2

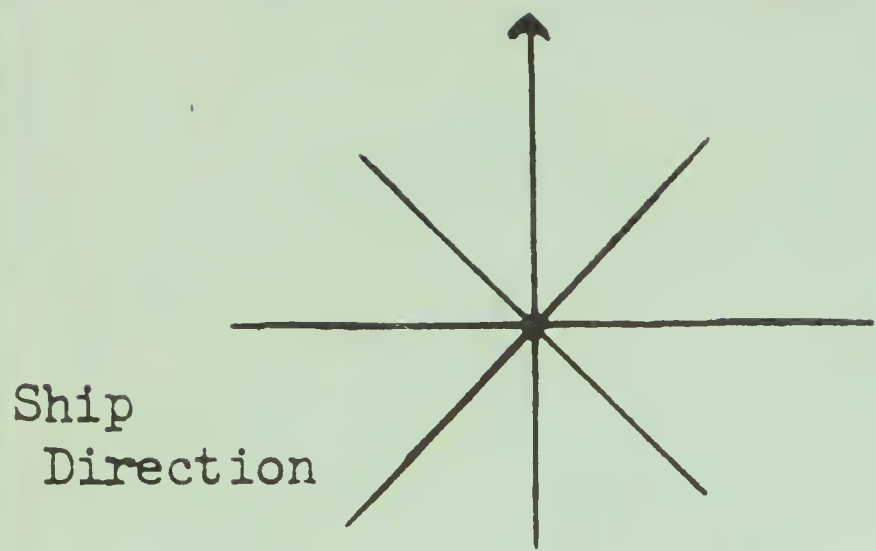
OR

TIMES IN LOCAL

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
1500-1600	SULA LEUCOGASTER	5-10	(about 25-30) total		2-3 groups flying about ship - diving - feeding on small fish just under surface circling about surface near ship
O. Tethys Rel 3	OCEANODROMA OCEANICUS	10			" " " "
	O. leucorhoa	5			" " " "
	Fregata minor	15			circling overhead
	Frigatebird				

OBSERVATION TIME - 1 HOUR

total 55-60



Ship
Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

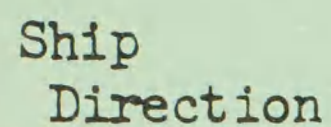
OBSERVERS:

Date 2 AUG 67
Pg. # _____

SPECIMEN
or

TIME SPECIES # DIR. BAND NO. REMARKS

No OBS



OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

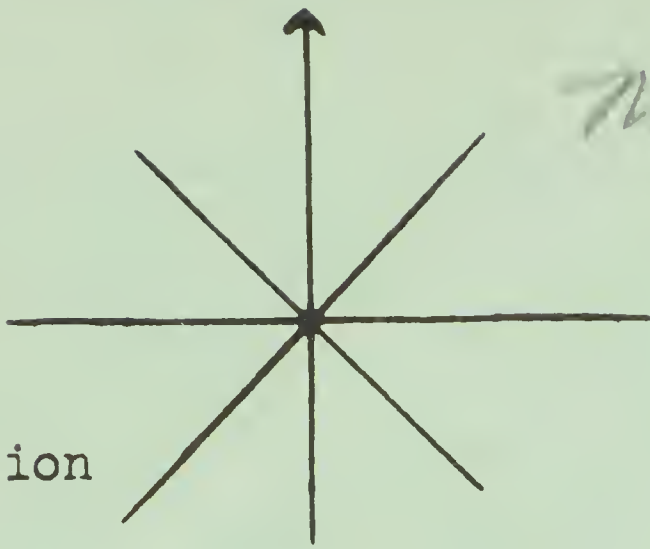
Date 3 AUG 67
Pg. # 1

SPECIMEN
or

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
------	---------	---	------	----------	---------

OBS TIME $\frac{1}{2}$ HR

20



Ship
Direction

7007 - 03°09'N - 79°41'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

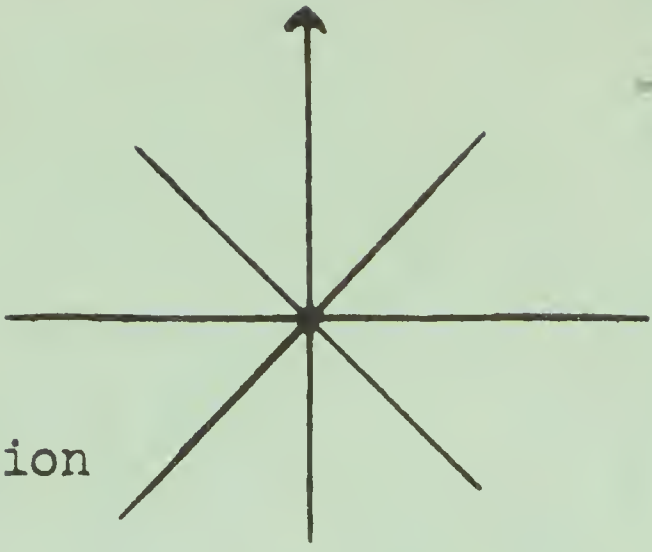
Date 4 AUG 67
Pg. # _____

SPECIMEN
or

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
1000-1500	(<i>O. leucorhynchus</i>)	10-15			about surface & wake - near stern on 4 off station
	<i>Sula dactylatra</i>	1	190°T		
	UNIDENTIFIED TERN	1	225°T		
	(<i>O. leucorhynchus</i>)	20-30			in wake
	<i>O. oceanicus</i>				
	<i>O. Tethys</i>	Rel 3			

5 HR OBS

32-47



Ship
Direction

noon - 01°07'N - 81°27'W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 5 AUG 67
Pg. # _____

SPECIMEN

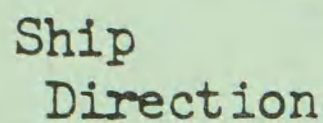
or

TIME SPECIES # DIR. BAND NO. REMARKS

1500	(<i>Oceanodroma leucorhoa</i> ?)				20-25 ind. 600yd off - feeding on surface
	<i>O. Tethys</i> Rel 3				
2000	<i>O. (leucorhoa)</i> 2				caught on deck, (identified as <i>Gabagaga</i> S.P.)
	<i>O. tristanii</i>				
	<i>O. hawaiiensis</i> 1				
					<i>Oceanodroma</i>
2015	(<i>Storm Petrel</i>) 1-2				white rumped - flew into & out of arc of light
	<i>Oceanodroma</i>				

OBS TIME: 1/2 HR

24 - 30



OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 6 AUG 67
Pg. #

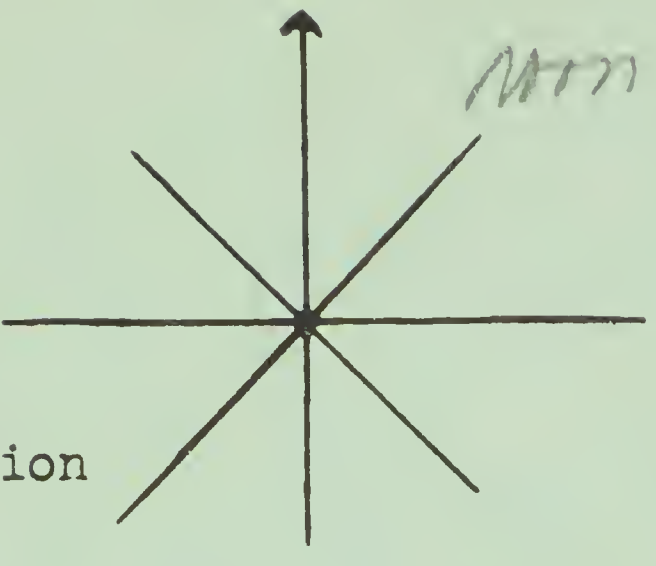
SPECIMEN
OF

SI-MNH-958-e
Rev. 5-66

Mm 2°28S - 80°04'W

OBSERVERS:

Ship
Direction



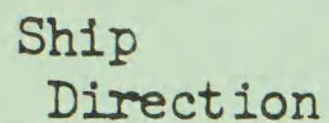
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 7 AUG 67
Pg.# _____

SPECIMEN
or

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0700-1000	O. T. Shear	25			
	Leach's St	100			
	Franklin's Gull	20			
	Brown Pelicans	15			
	Brown Boobies	20			
	Cape Pigeon	75			
Mag.	Frigate Birds				
	White egrets along banks of river	15			
	Larus cirrocephalus	75			
	Larus modestus	25			
		270			

various color phases } off mouth of
 & up Guayas
 River to
 Puerto Nuevo -
 Guayaquil, Ecuador



moon $02^{\circ}455' - 80^{\circ}27'W$

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 9 AUG 67
Pg. #

SPECIMEN
or

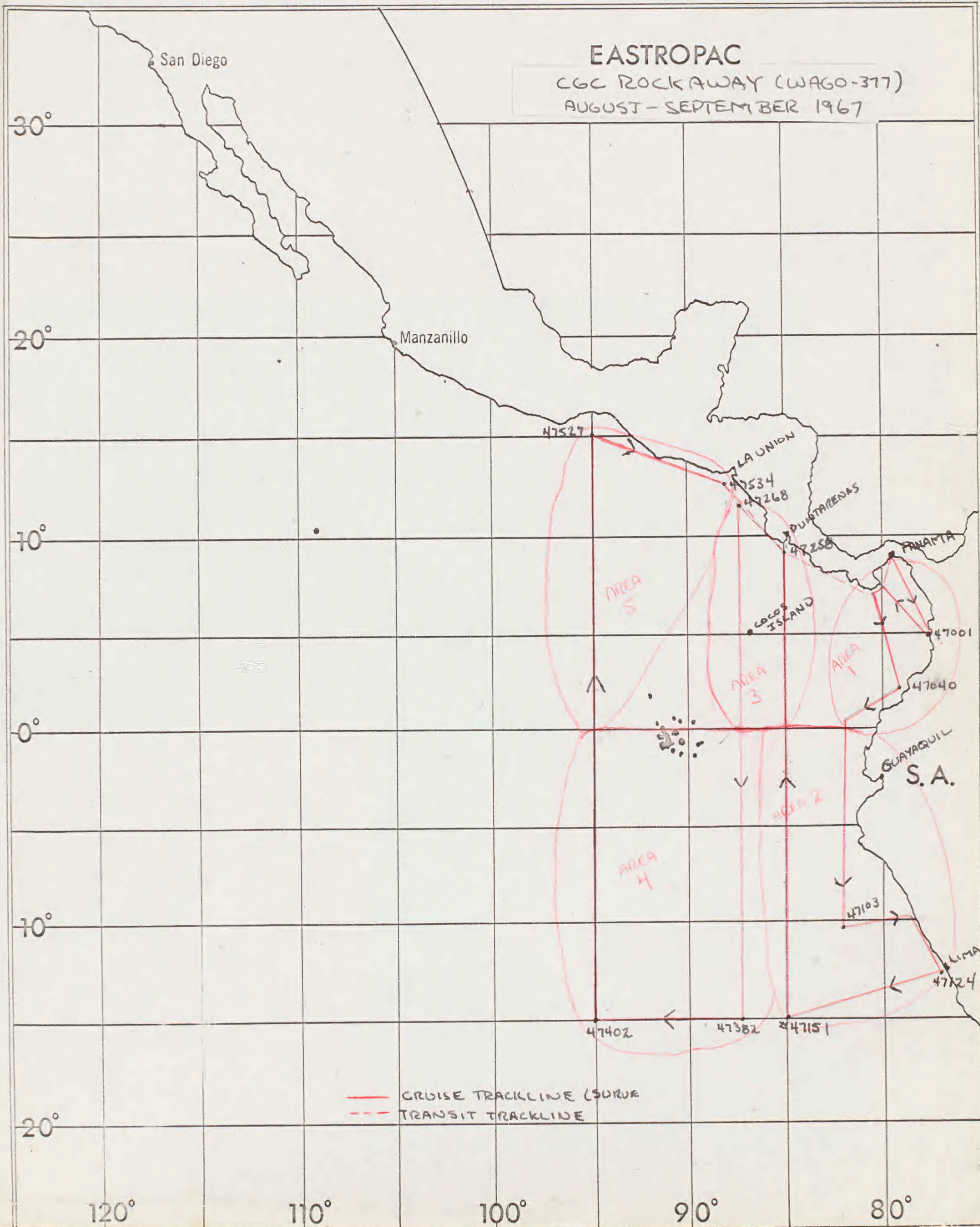
TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
------	---------	---	------	----------	---------

Same birds seen going down river, as up.
1400-1420 porpoises (20-30) about 10 mi SW of
River mouth (Guayas)

EASTROPAC

CGC ROCKAWAY (WAGO-377)

AUGUST - SEPTEMBER 1967



EASTROPAC - CGC ROCKAWAY
AUGUST - SEPTEMBER 1967
LIST OF BIRDS CAUGHT ABOARD VESSEL

STA.	DATE	TIME (LOCAL)	LAT	LONG	NO. SPECIES
✓ 47053	6 AUG 1967	2045	00-18N	081-57W	2. OCEANODROMA TRISTRAMI
					1 O. + ETHYS
^{between} 47072-47073	10 AUG 1967	0405	03-28S	082-01W	3. O. HORNBYI
			03-47S	082-02W	1 O. + ETHYS
					1 OCEANITES OCEANICUS
47101	12 AUG 1967	0400	09-29S	082-05W	1 O. HORNBYI
47109	13 AUG 1967	0400	09-35S	080-15W	1 PTERODROMO COOKI COOKI
5-6 MILES SW. of COCOS IS.		0400	-	-	1 SULA SULA
CHATHAM BAY, COCOS ISLAND			-	-	3 ANOUS STOURDS 1 GYIS ALBA
47310	4/5 SEPT 1967	2300			2 FREGATA SP.
			02-02N	088-03W	1 SULA SULA

Date: 5 October 1967

OCEANOGRAPHIC CRUISE OPERATIONAL REPORT

From: Commanding Officer, USCGC ROCKAWAY (WAGO 377)
To: Commander, Eastern Area

PART I - CRUISE PERFORMANCE

1. Survey Area - - - - - Eastern Tropical Pacific Ocean
2. Concise statement of mission: Participate in EASTROPAC oceanographic survey to collect physical, chemical, and biological oceanographic data in the waters of the Eastern Tropical Pacific with special attention placed on the equatorial waters and areas within 100 miles of a coast line in the region.
3. Departed homeport - - - - - 211309Z JUL 67
4. Arrived in survey area - - - - - 011905Z AUG 67
5. Departed survey area - - - - - 230310Z SEP 67
6. Arrived homeport - - - - - 051543Z OCT 67
7. Length of cruise (days; homeport to homeport) - - 76 days
8. Distance to and from survey area - - - - - 5,438 miles
9. Distance cruised in survey area - - - - - 8,760 miles
10. Total distance run - - - - - 14,217 miles
11. Augmentation personnel carried:

NAME	TYPE	INTERESTING
LTCJG D. F. LARSEN, USCG	Oceanographer	USCG Oceanographic Unit
AGT B. D. LOCKHART, USCG	Oceanographic Technician	" " "
SS S. B. ROBERTSON, USCGR	"	" " "
W. L. SLANE	Oceanographer	Inter-American Tropical Fish Commission
D. KELLOGG	Chemist	Scripps Institution of Oceanography
G. P. JOHNSON	Graduate Oceanography Student	" " "
J. J. McCAFFREY	"	" " "
P. V. PERIN	Pathologist	NSA - Weather Bureau
D. E. DUFF	"	" " "

PART II - SAR, COMMUNICATIONS AND MISCELLANEOUS

1. Number of distress, urgent and safety messages intercepted:

<u>TYPE</u>	<u>MARITIME</u>	<u>AERONAUTICAL</u>
BOB	<u>1^a</u>	<u>0</u>
XII	<u>17</u>	<u>0</u>
TTY	<u>36</u>	<u>0</u>

^aRelay from NMI. Auto alarm employed.

2. Instances of assistance (including communications, aids to navigation, radar fixes, medical, etc. Explain in Part V) -----

0

3. Number of persons rescued -----

0

4. Number of radicans aboard -----

6

5. Frequency Plans used -----

A1, A2, Bertha

6. Percentage of traffic transmitted via RATI -----

93.45

7. Maximum communication distance experienced -----

2,700**

8. Most reliable frequencies:

<u>DISTANCES</u>	<u>DAY</u>	<u>NIGHT</u>
2000 or less	<u>12754/16983.2</u>	<u>6467/8682</u>
2000-2500	<u>16983.2/22545</u>	<u>8682</u>
2500-3000	<u>22545/25380</u>	<u>12754</u>
3000-3500	<u>"</u>	<u>"</u>
over 3500 mi.	<u>"</u>	<u>"</u>

**With CGRADSTA NRIIS, 3,600 with CGRADSTA WASHDC.

PART III - METEOROLOGY

1. Number of MERSHIP observations relayed - - - - - 1

2. Number of:

<u>TYPE OBSERVATION</u>	<u>TRANS. TO SHORE STATION</u>	<u>NOT TRANS. TO SHORE STATION</u>
Routine Surface Obs. at Synoptic hours	<u>459</u>	<u>0</u>
Special Surface Obs.	<u>19</u>	<u>0</u>
Upper Wind Electronic Obs. (RAWIN)	<u>38</u>	<u>0</u>
Radiosonde Obs.	<u>79</u>	<u>0</u>

PAGE IV - OCEANOGRAPHY PROGRAM

A. POSITIONS OF VARIOUS STATIONS SURVEYED

1. The general area surveyed, described as Track VII of the Eastern Tropical Pacific Oceanographic Project, is shown on Enclosure 2 to this report. Specific positions of each station, together with time, type surveys made and the position accuracy estimated are attached as Enclosure 1.

B. BATHYTHERMOGRAPH PROGRAM

1. BT observations made:	<u>ENROUTE</u>	<u>SURVEY AREA</u>	<u>TOTAL</u>
200' mechanical	<u>0</u>	<u>0</u>	<u>0</u>
450' mechanical	<u>0</u>	<u>0</u>	<u>0</u>
900' mechanical	<u>0</u>	<u>10</u>	<u>10</u>
Expendable BT (EBT)	<u>19</u>	<u>256</u>	<u>275</u>

C. HYDROCAST (NANSEN CAST) PROGRAM

1. Casts made: 500 meters - - - - -	<u>61</u>
1000 meters - - - - -	<u>77</u>
2. Deep (bottom) casts made - - - - -	<u>21</u>

D. STD (SALINITY-TEMPERATURE-DEPTH) PROGRAM

1. 300 meter observations - - - - -	<u>49</u>
2. 500 meter observations - - - - -	<u>133</u>
3. 1000 meter observations - - - - -	<u>79</u>
4. Total STD observations made - - - - -	<u>261</u>

E. PLANKTON NET TOWS

1. Surface tows - - - - -	<u>156</u>
2. Oblique double net tows - - - - -	<u>152</u>
3. Micronekton tows - - - - -	<u>79</u>
4. Total plankton net tows - - - - -	<u>387</u>

F. SOUNDING PROGRAM

1. Number of miles of soundings enroute to and from area	<u>5,278</u>
2. Number of miles of soundings in survey area - - - - -	<u>8,723</u>
3. Total number of miles of soundings - - - - -	<u>14,001</u>

PART V - SUMMARY OF OPERATIONS

1. Visits to ports during the cruise:

<u>Port</u>	<u>Arrival Time</u>	<u>Departure Time</u>
<u>Maracaibo, Colombia</u>	<u>271534Z JUL 67</u>	<u>271216Z JUL 67</u>
<u>Medan NAVSTA, Canal Zone</u>	<u>302126Z JUL 67</u>	<u>312125Z JUL 67</u>
<u>Guayaquil, Ecuador</u>	<u>072209Z AUG 67</u>	<u>091326Z AUG 67</u>
<u>Callao, Peru</u>	<u>141344Z AUG 67</u>	<u>161729Z AUG 67</u>
<u>Puntarenas, Costa Rica</u>	<u>281730Z AUG 67</u>	<u>301409Z AUG 67</u>
<u>Coro Island, Costa Rica</u>	<u>031235Z SEP 67</u>	<u>032309Z SEP 67</u>
<u>Limón, El Salvador</u>	<u>241405Z SEP 67</u>	<u>271304Z SEP 67</u>
<u>Medan NAVSTA, Canal Zone</u>	<u>271333Z SEP 67</u>	<u>300120Z SEP 67</u>

2. Additional special projects carried out during the cruise.

<u>For</u>	<u>Performed For</u>
1. <u>Meteorology (including all-sky weather, synoptical and rain gauge)</u>	<u>Texas A&M University</u>
2. <u>IBT Obs. (at 20 mile intervals on selected portions of survey track)</u>	<u>Bureau of Commercial Fisheries, La Jolla, San Diego, Calif.</u>
3. <u>IBT and STD Obs. (saturation coverage within 2° of the equator and within 100 miles from land)</u>	<u>Bureau of Commercial Fisheries, La Jolla, San Diego, Calif.</u>
4. <u>Deep (bottom) hydrocasts every other night</u>	<u>NO Oceanographic Unit, Washing- ton, D.C.</u>
5. <u>Observation, collection and recording of marine life, especially birds, in upper area</u>	<u>Smithsonian Institute</u>
6. <u>Dir-netting marine life during the night watches</u>	<u>Bureau of Commercial Fisheries, La Jolla, San Diego, Calif.</u>
7. <u>Motion picture coverage of various associations throughout</u>	<u>Commandant (USP)</u>

PART V - SUMMARY OF OPERATIONS (CONT)

B. <u>Collection of plant and animal specimens - Coos Bay, Coos Bay, Oregon.</u>	<u>Collections will be distributed to various scientific organizations and museums.</u>
1. <u>Logistic support for survey of tidal range site on Coos Bay, Oregon.</u>	<u>Bureau of Commercial Fisheries, La Jolla, San Diego, Calif.</u>
2. <u>Equipment losses and/or damage:</u>	
<u>Equipment Description</u>	<u>Cause of loss or damage</u>
a. <u>One Hansen Bottle complete with two reversing thermometers.*</u>	<u>Pivot joint between wire clamp and bottle assembly failed. A design modification (as shown on Enclosure 3) was made to all Hansen bottles to correct this defect. The modification was successful.</u>
b. <u>One gin-net</u>	<u>Lost overboard during operations</u>
c. <u>One Loren bottle</u>	<u>Rivet came loose allowing bottle to separate from clamp</u>
d. <u>One complete surface net</u>	<u>Fell overboard</u>
e. <u>One complete oblique double net assembly</u>	<u>Bridge line parted due to unevenly loaded line caused by heavy rolling</u>
f. <u>Approximately 150 feet 3/16" - 3/8" stainless steel hydrographic cable</u>	<u>Cut off reel in several lengths at working end due to wear, etc.</u>
g. <u>Approximately 100 feet 1/4" - 3/8" galvanized, electroplated-conductor, STD cable</u>	<u>Cut off reel in several lengths at working end due to wear, etc.</u>

*Note: Board of survey completed on item a.

4. Additional comments, suggestions, and recommendations:

5. General port information

(1) Barranquilla, Colombia. The ROCKAWAY arrived in Barranquilla on 27 July for a two day recreational visit. The Sailing Directions for the port were satisfactory except with regard to the information on pilotage. The Directions state that a pilot boat is on duty 3/4 miles west of the breakwater. Although advance arrangements were made through ALBERTA, the ROCKAWAY had to wait almost two hours for the compulsory pilot. When aboard, he stated that they attend the breakwater from 0500 to 1800 hours the month of December through March. At other times they must be called on 2735 hrs. The pilots provided were competent and spoke English.

PART V - SUMMARY OF OPERATIONS (CONT)

The vessel berthed at a modern pier, the face of which was parallel to the axis of the Rio Magdalena River which runs at about a four knot current. Official calls were made on the Captain of the Port and on CAPT Oriba, the Commanding Officer of the Colombian Naval Base at Barranquilla. Several ship's officers and the senior civilian oceanographer were guests at a cocktail party given by the U.S. Consul, Mr. Robert J. Carls. A car and driver were furnished to the ship by the Colombian Navy. No stores were taken aboard.

(2) Rodman Naval Station, Canal Zone. Outbound, the ROCKAWAY stopped at the Rodman Naval Base overnight. 51,000 gallons of marine diesel fuel, some commissary and exchange supplies and movies were taken aboard. Also three civilian scientists from Scripps Oceanographic Institute joined the ship here. An official call was made on CAPT Purcell, USN, the Commanding Officer of the Base and a call was considered to have been made on Commodore, RADM Koch, USN. Logistic support, in the immediate charge of LT M. Cole, USN, was classed as outstanding and a letter of appreciation was directed to the Commanding Officer of the Base.

(3) Guayaquil, Ecuador. On 7 August the ROCKAWAY arrived at Guayaquil for a two day recreational visit. It is to be noted that the Sailing Directions did not give the correct location for the pilot station. However, this information was furnished by ALUSMA prior to arrival. Also, S.O. Chart No. 5949 does not show the extensive bridge system which is presently provided in the Guayas River. The ship was berthed at a modern pier complex known as Puerto Nuevo, about 12 miles from Guayaquil. Availability of a berth was a fortunate happenstance since the ROCKAWAY could not be accommodated if commercial ships were waiting. An ensign in the Ecuadorian Navy attended the ship, as liaison officer, during the entire stay. He was a graduate of the U.S. Naval Academy and was right at home on a North American ship. Also, the Navy made available a car and driver. Official calls were made on RADM F. Espinosa C., Commander of the First Naval Zone; Sr. B. Rosales A., Governor of the Province; Sr. A. Buzarros, Mayor of Guayaquil and Mr. R. Salvatierra, the U.S. Consul General. The port was about 40.9 miles up the Guayas River and pilotage was compulsory. The pilots provided were competent and spoke English. No stores were taken aboard.

(4) Callao, Peru. Arriving on 14 August, ROCKAWAY anchored in the roadstead at Callao for two days. Pilots were not used, although a Peruvian Naval Officer boarded with an anchorage assignment. ROCKAWAY's boats were used as liberty launches. Liberty was made in Callao and in Lima, 5 miles away. Official calls were made on RADM A. Suvarro B., the Commandant General of the Fleet on board his flagship and on CAPT A. Benavente C., the Port Captain of Callao. A liaison officer and a car and driver were provided by the Peruvian Navy during the entire visit. Lima was an interesting foreign port but it was not a popular visit due to high prices. Stores were not taken.

(5) Puntarenas, Costa Rica. A two day fueling stop and recreational visit was made at Puntarenas. The ship was berthed alongside a pier, secured by lines to the pier, an anchor to seaward and lines offshore to a mooring buoy. The additional moorings were required because of the exposed location of the pier. The ship continuously pulled and surged in a heavy ground swell. It was necessary to remain at the pier to receive

PART V - SUMMARY OF OPERATIONS (CONT)

the fuel which was pumped from several small tank trucks. No damage was inflicted except for snapped mooring lines. However, there was so much work and worry incident to being at the pier that Puntarenas is not recommended as a fueling stop. The port is interesting and a visit, with the ship at anchor, is worthwhile. Other than fuel, no stores were taken. Pilotage is compulsory for going alongside. The pilot was competent and spoke English. The Sailing Directions and charts were found to be satisfactory except that the principal coastal navigation light, Isla Blanca (No. 26280 in Light List H.O. 1113) marking the entrance to the Golfo de Nicoya could not be seen at night 12 miles off although it is indicated as a 25 mile light. Upon departure, the Cape was rounded 6.0 miles off and it was observed the light structure, an Eiffel Tower-type steel lattice, had collapsed and was lying horizontally on the crest of the Cape.

(6) Cocon Island. Cocon Island was not a scheduled visit, however, a stop was made there at the request of Mr. Almer the senior civilian oceanographer so that he could survey the site for a tidal gauge proposed to be installed by the Bureau of Commercial Fisheries. After permission was received from the Commandant, the island was approached on the promise that a landing would be made only if the surf conditions permitted. Satisfactory conditions were found at Chatham Bay and the survey group was landed. Also, the opportunity was taken to hold a ship's party ashore. Over a period of eight hours all hands got ashore to explore an uninhabited, tropical island rich in pirate lore. The ROCKAWAY's name was chiseled into a boulder on the beach commemorating our visit in the same manner as other ships had done, with dates going back to the 1700's.

(7) LaUnion, El Salvador. After completion of the oceanographic mission, the ROCKAWAY stopped at LaUnion for a three day visit while enroute home. No pilots were employed. The Sailing Directions for the port and the approaches were found to be current and correct. However, an excellent navigational mark, the Islas Paraisos in the mouth of the Golfo de Fonseca were found to be incorrectly located on H.O. Chart No. 573. The other topography in the area provided ample means to ascertain and cross check the vessel's position after the initial inconsistencies were resolved. The ship was berthed at the Customs pier for nine hours to take on 15,000 gallons of fuel after which she anchored in LaUnion Bay for the remainder of the visit. Two of the civilian scientists were disembarked at this port. An official call was made on Colonel Amerson, the Captain of the Port, and he made one of his patrol boats (a CG type 40 footer) available to augment the ROCKAWAY's liberty boats. As a good will gesture towards the community, 48 cases of soft drinks were contributed to the local orphanage. Other than fuel, no stores were taken at this port.

(8) Rodman Naval Station, Canal Zone. Rodman Naval Base was the final port before return to New York. The ship berthed for eleven hours to take on 119,000 gallons of marine diesel fuel and some commissary and exchange stores. Seven persons, including Weather Bureau personnel, civilian scientists, and personnel from the Coast Guard Oceanographic Unit were disembarked. The Canal transit was made at night.

PART V -- SUMMARY OF OPERATIONS (CONT)

b. Electronics. All electronic equipment functioned satisfactorily. Time spent on repair of outages was not in excess of the average maintenance/operation ratio except in the case of the following equipment:

(1) AN/SPS-12E - Omega Navigation System. An inordinate amount of time, both day and night, was spent in synchronizing the Omega stations. Each synchronizing operation would last about one hour and sometimes it would have to be done three times a day. Probably one reason for this difficulty is the fact that no personnel on board have been trained in the maintenance or adjustment of this sophisticated and unique equipment.

(2) AN/FRT-23 - Radio Transmitter. A cruise requirement to communicate on a daily schedule with a commercial station as well as a Coast Guard station, together with the ship's operating procedure of using dual transmission for RATT made it necessary to shift frequencies on the AN/FRT transmitters sometimes as often as fifty times in a single day. This placed a burden on the mechanical components involved in frequency shifting which, because of the age of the equipment and the unavailability of parts, created a problem of excessive maintenance and a continual threat of major failure with resultant loss of communications. This condition was controlled during this cruise but it has not been resolved. Long oceanographic trips make necessary an increase in the CGSAL spares for the AN/FRT-23 Transmitter.

(3) Teletype equipment functioned well for the first six to eight weeks of the cruise. After that time constant adjustments became necessary due to normal wear of the equipment. Outages became frequent and excessive man hours had to be utilized probably because no personnel assigned have been trained for this equipment.

(4) Because of its electronic character, ET's were called upon to repair inoperative oceanographic equipment. Although several effective repairs were accomplished, the time expended was disproportionate due to basic unfamiliarity with the equipment and lack of adequate instruction manuals.

c. Communications.

(1) Communications with COMUSSTA New York (NYC) and COMUSSTA Portsmouth (NSM) were excellent during outbound and inbound transit of Third and Fifth District waters.

(2) For the major portion of the voyage, COMUSSTA New Orleans (NSN) was used as the primary relay point for all traffic. Communications were classified as good, with approximately 93 per cent of traffic volume handled by radioteletype (RATT) and the remainder by voice (CV). Whenever contact with COMUSSTA New Orleans was lost, COMUSSTA NASCOC (NSC) was used as a back-up. Less than 1 per cent of the volume was passed by this route.

PART V - SUMMARY OF OPERATIONS (CONT)

(3) Heavy station interference (Brazil, Denmark, Japan, Spain, U.S. and Russia) was noted on the A1 and A2 circuits during hours of darkness. Good to excellent communications existed during all daylight hours. The higher frequencies of 22545 and 25380 kilocycles were generally clear of interference and afforded good to excellent signal strengths.

(4) The beam antenna installed at CGRADSTA New Orleans to service ROCKAWAY went into operation about mid-September. Thereafter, an average signal of strength "three" increased to "five" when this antenna was employed.

(5) Continuous watches were maintained in all ports and communications were generally good except in Guayaquil, Ecuador, and in Callao, Peru. Difficulties in these ports were attributed to surrounding mountains.

(6) In addition to the Coast Guard circuits, ROCKAWAY was required to maintain direct communications with WMD, the Bureau of Commercial Fisheries station at LaJolla, California. 17105 kilocycles proved to be the most reliable frequency of those available to that station. Bathy, status reports and general EASTROPAC messages were passed to this station on five daily schedules except for a period from 16-21 August when one AN/PKS-23 transmitter failed.

(7) Based on the above experience, the following recommendations are made:

(a) That the oceanographic frequencies formerly listed as circuit A14 (6246, 8325, 12474, 16626 and 22151 kilocycles, RMT) be returned for usage during the January-April EASTROPAC. This would provide sufficient alternate frequencies to be employed when periods of heavy interference are encountered.

(b) That permission be obtained from Commandant to employ CW emission on circuit A2 frequencies whenever the RMT mode becomes unusable.

d. Engineering. The machinery plant performed satisfactorily throughout the cruise. Fuel economies were affected by two engine operations when running between oceanographic stations. Cruise planning included a scheduled fueling stop at Puntarenas at which time 50,000 gallons were to be taken. However, because of the price of 13 cents a gallon, this quantity was reduced to 25,000 gallons. Performance figures for the first half of the cruise indicated that this would be sufficient. However, a medover and cumulative operational differences in the second half of the voyage necessitated a second, and originally unscheduled, fueling stop. This was made at LaUnion where an additional 15,000 gallons were taken at approximately the same cost per gallon. In both ports the fuel was of good quality having little sediment or water content. In Puntarenas the fuel was pumped from tank trucks and required almost ten hours to take on 25,000 gallons. In LaUnion the fuel was received from two 7500 gallon railroad tank cars and was gravity fed to

PART V - SUMMARY OF OPERATIONS (CONT)

The vessel in a much more expeditious manner. The boilers and evaporator performed satisfactorily. Water hours or salt water hours did not have to be imposed and fresh water was taken aboard only at the Rodas Naval Base. The electrical plant performed satisfactorily. There was a major repair to the voltage regulator on the No. 2 generator which could not be repaired by the ship's force. A spare was not on the allowance list. Procurement of a replacement from the U.S. was attempted but was unsuccessful. The difficulty was overcome for the duration of the cruise by jury rigging the regulator transformer on No. 1 generator so that it could be switched to serve the generator which was on the line. The three generators performed satisfactorily. There were failures but these were repaired without loss to the mission. The failure involving the new air conditioning unit which was directly attributable to faulty assembly at the time of construction. A set screw which secured the auxiliary drive sprocket to the leg of the replacement pump shaft had not been installed. This permitted the sprocket to slide on the shaft causing the misalignment and ultimate failure of the chain drive which was driven by this sprocket. A replacement chain was not included in the spare provided, so a temporary repair was effected by disassembling the chain and combining its component parts to fabricate a new chain of lesser width than the original. This repair served satisfactorily for the remainder of the cruise.

5. Operations.

(1) Navigation. While in the oceanographic survey area, three methods of navigation were available, namely dead reckoning, the Omega system, and celestial. Omega was not useful because it demonstrated a position accuracy ranging from eight to 25 miles off when cross-checked against accurate fixes obtained by other means. This was probably attributable to the lack of specially trained personnel personnel as mentioned in section 4(b) above. Celestial navigation was the primary method used but due to a continual heavy cloud cover encountered in the operating area, position fixing had to be by dead reckoning rather than by celestial. Consequently, course stations very often had to be made on the basis of dead reckoning with the best information on the actual position of the station not being established until several hours later. To insure that the position of record for any station was the one based on the best information regardless of when it was established, a ship prepared form, Enclosure 4, was utilized. One form was prepared for each station. It was initiated by the G.U.D. at the time the station was taken but it was not completed and released to the Oceanographic Department until the navigator had made his final determination of position and position accuracy.

(2) MEDICAL. On 12 September LTJG Perry W. SMITH USN, USN became seriously ill with a severe infection of a tooth. Medical advice was requested from the USN Hospital, Staten Island. They prescribed treatment and recommended early evacuation. This was not possible because JOCKAMAY was at the extreme southern limit of the cruise. Four alternatives were available -- treat the patient on board until arrival at the next port twelve days hence; proceed to the nearest land 20 days away (this was the Galapagos Islands where the medical facilities were questionable); return to South America, a thousand miles away; transfer the patient to a shore-based ship. All four alternatives were considered.

PART 7 - SUMMARY OF OPERATIONS (CONT)

Public Health defined a symptom which would make the case an emergency -- the symptom appeared. USADO Ecuador advised that competent medical personnel were stationed in the Galapagos. AMVERB provided data on two ships suitable to our purpose within thirteen minutes after a request for a RI-10 surple of east-bound ships had been transmitted. The latter alternative was selected because it afforded the least diversion from the mission. Attempts to raise the ships on radio were unsuccessful for about twenty hours and then contact was made with the British freighter SS SOMERSET, Captain Weston commanding. Captain Weston was extremely cooperative and at 1700 GMT on 13 September he diverted his ship to rendezvous with ROCKAWAY at 1200 GMT on 14 September. The rendezvous was made at the appointed time and position and LTJG BRADY was transferred by small boat for transportation to Balboa. The ROCKAWAY then turned south to resume her oceanographic survey at the location where it had previously been halted.

f. Meteorology.

(1) A meteorology program was carried out in accordance with the specifications laid down by the Weather Bureau. Two weather observers were assigned for this work and the program was under the supervision of the senior observer, Mr. Frank Perry. Three AG's from the ROCKAWAY were assigned to participate full time in this program. Although every effort was made to facilitate the weather observations, in cases of direct conflict with the oceanographic program the latter was given precedence. For example, if the ship was stopped with a hydrocast down we would not get underway to achieve an optimum balloon run. Similarly, if underway between oceanographic stations the ship would deviate from course for balloon release but would not divert to achieve an optimum run. As a measure of the effect this operational constraint had on the weather program, it may be stated that out of 136 balloon releases, 32 could not be tracked by radar. At least half of these could have been tracked if the vessel could have been maneuvered so as to assist the radar in acquiring and holding the target.

g. Oceanography.

(V) Introduction.

(a) In accordance with COMNAVSTA's Sailing Orders and the Manual for EASTROPAC Observations, a survey of the Western Tropical Pacific Ocean was conducted by USS ROCKAWAY from 1 August to 23 September 1967, concurrently with similar surveys being made by the UNDAUNTED, operated by the Bureau of Commercial Fisheries, and the THOMAS J. WASHINGTON, operated by the Scripps Institution of Oceanography. ROCKAWAY's basic survey involved operations on three types of oceanographic stations, termed A, B, and C stations, along tracklines off the coast of South and Central America extending as far as 15° South latitude and 95° West longitude. [For a detailed summary of observations at each station see Enclosure (1).] Observations at A stations, completed twice daily at noon and midnight, included 1000 meter STD and hydrocasts, beam trawls (for productivity and pigment determinations), oblique, surface, and micronekton tows, and night life dip-netting at midnight stations for collection of physical, chemical, and biological data. Subsequent analyses included quantitative chemical determinations of oxygen, salinity, nitrate, nitrite, silicate,

PART 9 - SUMMARY OF OPERATIONS (CONT)

phosphates, and ammonia (frozen for later analysis ashore) and biological determinations of plant pigments, and productivity. B stations, twice daily between A stations, included 500 meter STD and hydrocasts, and oblique and surface plankton tows; chemical analyses were carried out as above. At C stations, occupied midway between the A and B stations, only expendable bathythermograph observations were made. A and B stations were generally separated by 42 miles so that the effective sampling interval was about 21 miles.

(b) While underway, continuous observations for the majority of the cruise included depth, near-surface temperature and salinity, near-surface chlorophyll, incoming solar radiation, wet and dry bulb temperature differences, three-hourly surface weather observations, and twice-daily upper air observations and, additionally, a survey of bird life was made including statistical count, identification, photography and specimen collection.

(c) Between 5° North and 5° South and when within 100 miles of land 500 meter STD casts were made in lieu of the usual STD observations at C stations, and midway between all stations STD drops were made. This reduced the sampling interval in these areas to 10 miles. On the basic tracklines hydrocasts to as close to the bottom as possible were made every second day. Along transit legs (i.e., passages from one assigned trackline to the next) 300 meter STD casts were made every 20 miles.

(d) A stop was made at Roca Island to examine possible sites for the installation of a tidal gauge for the Bureau of Commercial Fisheries. While ashore on the island, biological specimens were collected.

(2) Performance of Oceanographic Equipment and Instrumentation.

(a) The STD System.

1. The STD functioned efficiently throughout the cruise except for two failures which resulted in some lost data at five stations. The first casualty resulted from a loosened terminal within the temperature sensing element, and the second from a slow leak in the depth sensor causing internal corrosion to such an extent that one of the pointed circuits had opened and had to be rebuilt.

2. The 1/4" galvanized steel electronic conductor cable served well during the cruise. It was reterminated several times to remove sections at the outboard end which exhibited signs of excessive wear. The remainder of the cable appears to be satisfactory in that there are no fish hooks, severe abrasions, etc. However, note must be taken of its age and the use to which it has been subjected. It is understood that Scripps Institution, or their oceanographic vessels, replace this cable every six months to prevent the loss of the expensive STD unit.

3. The major problem with the STD system aboard the ROCKAWAY is the location of the winding system. The winch is located on the 02 deck, port, at Frame 73, and the A-frame and wire platform is on the 01 deck. The sheave over which the cable runs is approximately 30 feet above the water and this, together with the length of the haul and

PART V - SUMMARY OF OPERATIONS (CONT)

the additional inset of the U deck, results in inadequate clearance when handling the 170 lb. underwater fish. It only requires a 8° roll for the fish to strike the hull when it is being raised or lowered. Although fairly well protected by a stainless steel framework circled with solid rubber bumpers, the sensitive electronic components undoubtedly suffer from the occasional impact received when hitting the ship. The failures referred to above may have been attributable to this cause.

(b) PDP-8S Computer.

1. The PDP-8S computer and the ASK-33 teletype I/O unit satisfactorily completed all the data processing for which it was scheduled. This included correction of reversing thermometer temperatures; density, sound velocity, and dynamic height anomaly calculations from STD obtained data; calculation of chemical concentrations (oxygen, nitrates, nitrites, phosphates and silicates), preliminary conversion of fluorometer readings to chlorophyll and phaeophytin concentrations; calculation of distances between stations from positional information; and conversion of conductivity, as measured by laboratory salinometer, to salinity. However, the operation of this equipment was erratic and required excessive operator time. During the first three weeks of operations difficulty was encountered in getting the computer to operate at all. Program tapes fed in through the slow speed reader functioned normally at times, and at other times not at all. When program tapes did feed in, the computer worked well sometimes for an hour or two at most, then stopped and would not restart, or even read in a program tape. Repeated attempts to get it going failed; high room temperature was suspected, as were the voltage regulator and the cooling fans. After trying various combinations of room temperature, voltage regulator on or off, and fans on or off, the problem somehow eliminated itself for an unknown reason, and for the remainder of the cruise operated with intermittent temporary failures.

(c) Hydrographic Cable. Immediately prior to this cruise the 3/16" stainless steel 7x19 hydrographic cable was replaced with a newly developed, three stranded, torque-balanced wire rope. It is identified as United States Steel Tiger Brand 3/16" stainless steel 3x19 wire rope. Its claimed advantage is greater strength and increased resistance to corrosion and wear. These qualities could not be evaluated except that it is noted that there were no failures and no fish hooks or kinks have developed. Service experience with this cable is considered to be satisfactory, however, the following drawbacks are noted:

- a. Due to the wire's three strand construction and non-circular cross-section, it did not spool as well onto the cable drum.
- b. It deeply grooved the sheave and cheeks of the reeled block. Also, it cut several leather and plastic rollers to ribbons.
- c. Its cross-section caused the Vaneck rollers to "dig up" on the wire strands. To remedy this the retaining groove on the Vaneck rollers had to be widened.

PART V - SUMMARY OF OPERATIONS (CONT)

d. The wire vibrated when under load in the water. This phenomenon was not experienced with the former wire. This is not necessarily an adverse effect but it possibly could cause inadvertent premature release of the messengers and premature reversing of the Hansen bottles.

(d) Chemistry instrumentation. Except for minor problems setting the spectrophotometer up and pairing cells for nutrient determinations, the chemical analyses went smoothly; the data are considered to be of high quality.

(e) Biological instrumentation.

1. A midwater trawling winch installed just prior to sailing provided the much needed capability for conducting micronekton tows. However, a problem does exist. The cruise specifications required that the tow be conducted at a 5 knot speed so that a depth of 200 meters could be obtained by letting out no more than 800 meters of cable. To strain and retrieve this amount of cable required 43 minutes and the ROCKAWAY cannot operate at 5 knots for this period of time. It was necessary to proceed at 6.2 knots which resulted in:

a. The desired depth not being reached. As measured by a mechanical BT attached to the net frame the depths attained varied from 130 to 160 meters.

b. Delicate specimens were damaged even though the ship was stopped while hauling the last 100 meters of cable so that the catch would not be dragged through the propeller wash.

2. Although hampered by the lack of required steady two knot ship speed, oblique tows, conducted from the hydro platform midships, went well except in areas of strong subsurface currents which carried the nets unavoidably beneath the ship so that the desired 45° wire angle could not be maintained while trying to maneuver away from the nets. Rough weather caused the loss of one double net rig when its bridle parted under the sudden impact loading imposed by heavy rolling. While these conditions prevailed an additional four tows were not made for fear of losing the spare rig.

(f) Pigment and productivity instrumentation.

1. The RCF Macaley recorder, connected to the Turner Fluorometer and designed to record continuous near surface chlorophyll measurements while underway, functioned erratically throughout the cruise. Hours were spent trying to determine the malfunction, but since no maintenance or trouble shooting manual was provided with the instrument, all work was fruitless. Although a continuous record of surface chlorophyll is lacking, periodic notation of the fluorometer readings were logged on the Macaley recorder chart to give a semi-continuous record of near surface chlorophyll.

PART V - SUMMARY OF OPERATIONS (CONT)

2. In connection with the productivity measurements, the light incubator, designed to duplicate light intensities of predetermined depths was discovered cracked and the white cloth wrappings (used to duplicate the above depth-light intensities within the incubator) yellowed so that originally determined intensities would probably be no longer valid. The cloth wrappings were washed and bleached, and the crack repaired, so that although the intended calibration was not duplicated, samples were incubated daily with the hope that a correction factor could be determined and applied prior to data analysis by comparison with duplicate samples run with a good incubator. A second incubator was not received until arrival in Puntarenas, Costa Rica, so that approximately half of the productivity work was done with this suspect incubator.

(g) Meteorological Equipment. Texas A&M University provided HOCHMAN with meteorological equipment including an all-sky camera, pyroheliometer, dew point, wet and dry bulb temperature difference and air temperature recording apparatus. Due to a lack of adequate instruction information and a malfunctioning power supply for the all-sky camera, shipboard personnel were unable to set up the gear. No observations were taken for the first seven days. Upon arrival in Quezaltenango, Guatemala, a representative from Texas A&M flew down to make the repairs. He was unable to fix the air temperature recording apparatus, so that apparatus was inoperative during the entire cruise. The pyroheliometer system, once operative, ran well as did the dew point instrument. The all-sky camera's power supply was repaired, however, the camera's operation throughout the cruise is questionable. Although the camera gave occasional appearance of operating satisfactorily, removal of the film cartridges at several times during the cruise showed internal failures, so that the amount of data collected will not be known until the film is developed.

(h) Salinograph-Thermograph. The Salinograph-Thermograph operated without serious malfunction throughout the entire cruise, however the salinity trace read approximately 1 ppt lower than comparative values obtained from surface samples and STD data, so that, before data can be analyzed, a correction factor will have to be determined and applied.

(i) Expendable BT.

1. The Expendable BT's operation was satisfactory during most of the cruise, however, a total of six casts were aborted because of erratic operation. The cause was eventually traced to a short in the launcher system.

(j) Recommendations.

(a) In consideration of the age of the STD cable and the usage to which it has been subjected in the previous cruises, it is recommended that authorization be granted to cut off at least 2000 meters from the outer end of this cable. This would leave approximately 3000 meters of cable for future operations. It is to be clearly noted that this recommendation is not based on any physical evidence of deterioration or weakness.

PART V -- SUMMARY OF OPERATIONS (CONT)

(b) To improve the situation with respect to the SYB underwater unit striking the hull when being raised or lowered it is recommended that a modification be made to the A-frame and a new work platform be installed on the main deck as shown on the sketch, Enclosure 5. This configuration would be used only in conjunction with the SYB. If the port winch is ever required for hydrocasts, the present arrangement would still be available.

(c) The difficulties encountered in making effective use of the F04-88 computer during the cruise indicate that the system has a serious short-coming if real time data reduction is necessary. In view of this it is recommended that the present 10 cps reader be replaced with a 300 cps unit.

(d) Since duplicate scientific apparatus is not provided, it is recommended that an instrument technician, qualified in the repair of oceanographic instrumentation be assigned to the ship, at least for the duration of the longer voyages. At present most of the instruments aboard the ROCKAWAY are new and relatively trouble-free. However, in time more failures will occur and data will be lost.

(e) In order to provide adequate time for installation and testing, it is recommended that all supplementary scientific equipment, to be employed on the next EASTROPAC cruise, be delivered to the vessel at least two weeks before the scheduled departure date, 20 January 1964.

(f) The quarters assigned to the civilian scientists who participated in the cruise were the best available short of displacing any of the ship's regularly assigned officers. Although no complaints were received from any of this group, it is the opinion of this command that the quarters furnished to them are not commensurate with their professional status. While this situation cannot be completely alleviated it would be substantially relieved if the senior civilian scientist could be provided with private and suitable accommodations. At the very least this would be a gesture towards recognizing, through him, the importance of the scientific group to the basic mission of the ROCKAWAY. Enclosure 6 shows one suggestion for accomplishing this. It would provide a stateroom having approximately 95 square feet of deck space in an area presently allotted to the senior officers of the ship. This space, which was formerly used for radio beacon equipment, is not being effectively used at present. The structural changes required consist of removal of heavy steel reinforcing originally installed to support a gun mount. Removal of this structure will not reduce the strength or seaworthiness of the ship. Exhaust and supply ventilation, lighting fixtures, and insulation on all bulkheads and the overhead are already installed but would require minor modification. Stateroom furniture, heating and a wash basin would be required. It is recommended that this proposal, or any other that would accomplish the intended purpose, be considered for funding and implementation at an early date.

PART V - SUMMARY OF OPERATIONS (CONT)

(4) Evaluation of Data Collected.

(a) All scientific data collected was forwarded to the Coast Guard Oceanographic Unit, Washington, D.C. for further processing and analysis. A final evaluation of the quality of the information is not available at this time.


EDWARD P. BOYLE

Distr
COMDT(CMS) (5)
COMEASTAREA (5)
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CGOU (12)

OCEANOGRAPHY PROGRAM

POSITIONS OF THE VARIOUS STATIONS SURVEYED

(LEGEND) - Types of surveys made: B/HYDRO - deep (bottom) hydrocast; HYDRO - hydrocast (Mannan Cast); STD - salinity/temperature/depth measuring system used; BN - dip netting; XB - expendable Bathythermograph; SURF - surface plankton tow; MB - micro-nekton tow; ODNT - oblique double net plankton tow; LEI - Loran Cast. Position accuracy in miles.

STATION	POSITION	TYPE SURVEYS MADE	TIME (Z) JUG 87	POSITION ACCURACY
47001	05-35N 077-51W	HYDRO, STD, ODNT, SURF	011905	2
47002	05-44N 077-56W	XB	020233	2 1/2
47003	05-50N 078-02W	STD	020322	3
47004	05-54N 078-12W	XB	020427	4
47005	06-05N 078-21W	HYDRO, STD, ODNT, SURF, BN, LEI	020510	4
47006	06-15N 078-22W	XB	020620	4
47007	06-20N 078-31W	STD	020849	4
47008	06-25N 078-41W	HYDRO, STD, ODNT, SURF	020946	4
47009	06-41N 079-00W	STD	021325	4
47010	06-47N 079-07W	XB	021425	4
47011	06-50N 079-16W	HYDRO, STD, ODNT, SURF, MB, LEI	021514	4
47012	06-56N 079-25W	XB	022031	4
47013	07-02N 079-32W	STD	022120	3
47014	07-14N 079-43W	XB	022240	2 1/2
47015	07-17N 079-48W	STD	022315	2
47016	07-19N 079-47W	XB	030050	2
47017	07-05N 080-19W	STD	030130	2
47018	06-58N 080-54W	XB	030355	2
47019	06-58N 080-54W	HYDRO, STD, ODNT, SURF, MB	030420	2
47020	06-47N 080-46W	XB	030908	2
47021	06-41N 080-49W	XB	030945	4
47022	06-21N 080-41W	HYDRO, STD, ODNT, SURF	031115	4
47023	06-09N 080-36W	XB	031400	4
47024	06-01N 080-35W	STD	031449	2 1/2
47025	05-41N 080-31W	HYDRO, ODNT, SURF, MB, LEI	031608	4
47026	05-30N 080-24W	XB	031825	4
47027	05-16N 080-18W	XB	032225	4
47028	05-51N 080-15W	HYDRO, STD, ODNT, SURF, MB, LEI	040020	4
47029	04-40N 080-14W	BT (Mech)	040440	4
47030	04-27N 080-07W	BT (Mech)	040605	4
47031	04-11N 080-03W	BT (Mech)	040725	4
47032	04-03N 079-54W	HYDRO, ODNT, SURF	040830	4
47033	03-42N 079-49W	BT (Mech)	041143	3
47034	03-19N 079-44W	HYDRO, ODNT, SURF, MB, LEI	041510	2 1/2
47035	02-57N 079-36W	BT (Mech)	041836	3
47036	02-32N 079-30W	HYDRO, STD, ODNT, SURF	042030	3
47037	02-23N 079-25W	BT (Mech)	042315	3
47038	02-06N 079-28W	STD	050010	2 1/2
47039	01-51N 079-24W	BT (Mech)	050110	2 1/2
47040	01-41N 079-22W	HYDRO, STD, ODNT, SURF, MB, BN, LEI	050230	2 1/2

ENCLOSURE (1)

STATION	POSITION	TYPE SURVEYS MADE	TIME(S)	POSITION ACCURACY
47041	01-38N 079-34W	IBT	050615	3
47042	01-37N 079-39W	STD	050641	3
47043	01-31N 079-58W	STD	050830	3
47044	01-27N 080-17W	STD	051012	2
47045	01-21N 080-35W	IBT, STD	051155	2 1/2
47046	01-17N 080-54W	STD	051338	2 1/2
47047	01-14N 081-15W	STD	051553	3
47048	01-05N 081-36W	STD	051732	3
47049	01-00N 082-00W	HYDRO, STD, GUNT, SURF	051935	3
47050	00-50N 082-00W	IBT	052135	4
47051	00-40N 082-00W	STD	052230	4
47052	00-26N 081-58W	IBT	052355	4
47053	00-18N 081-57W	D/HYDRO, HYDRO, GUNT, SURF, STD, MB, DB, LEX	060025	4
47054	00-02N 081-54W	IBT	060653	4
47055	00-10N 081-58W	STD	060726	4
47056	00-17N 081-55W	IBT	060830	4
47057	00-22S 082-00W	HYDRO, STD, GUNT, SURF	060900	2 1/2
47058	00-32S 082-00W	IBT	061111	2 1/2
47059	00-44S 082-00W	STD	061155	2
47060	01-00S 082-01W	IBT	061315	2 1/2
47061	01-11S 082-02W	HYDRO, STD, GUNT, SURF, MB, DB, LEX	061400	2 1/2
47062	01-13S 082-02W	IBT	061700	3
47063	01-26S 082-00W	STD	061804	3
47064	01-38S 081-59W	IBT	061920	3
47065	01-46S 081-58W	HYDRO, STD, GUNT, SURF	062020	2
47066	01-54S 081-58W	IBT	062238	2 1/2
47067	02-06S 081-58W	STD	062338	4
47068	02-18S 081-53W	IBT	070040	4
47069	02-27S 081-52W	HYDRO, STD, GUNT, SURF, MB, DB, LEX	070120	4
47070	03-06S 082-01W	HYDRO, D/HYDRO, STD, GUNT, SURF, MB, DB, LEX	092350	4
47071	03-21S 082-01W	IBT	100545	4
47072	03-28S 082-01W	STD	100733	4
47073	03-47S 082-02W	IBT	100923	4
47074	03-58S 082-02W	HYDRO, STD, GUNT, SURF	101015	4
47075	04-10S 082-03W	IBT	101217	4
47076	04-20S 082-03W	STD	101255	3
47077	04-30S 082-03W	IBT	101355	3
47078	04-39S 082-03W	HYDRO, STD, GUNT, SURF, MB, DB, LEX	101430	2
47079	04-54S 082-03W	IBT	101620	1 1/2
47080	04-59S 082-03W	STD	101850	2
47081	05-11S 082-03W	IBT	102006	2 1/2
47082	05-21S 082-03W	HYDRO, STD, GUNT, SURF	102055	2 1/2
47083	05-37S 082-03W	IBT	102330	3
47084	05-44S 082-03W	STD	110000	3
47085	05-55S 082-01W	IBT	110110	4
47086	06-04S 082-00W	HYDRO, STD, GUNT, SURF, MB, DB, LEX	110155	4
47087	06-17S 082-00W	IBT	110530	4

ENCLOSURE (1)

<u>STATION</u>	<u>POSITION</u>	<u>TYPE SURVEY MADE</u>	<u>TIME (2)</u>	<u>POSITION ACCURACY</u>
47088	06-223 082-00W	STD	110620	4
47089	06-345 081-59W	XBT	110750	4
47090	06-473 081-58W	HYDRO, STD, CDMT, SURF	110835	3
47091	06-573 081-58W	XBT	111110	3
47092	07-073 081-58W	STD	111201	3
47093	07-123 081-57W	XBT	111312	3
47094	07-223 081-57W	HYDRO, STD, CDMT, SURF, MI, LEX	111400	2 1/2
47095	07-475 081-59W	XBT	1117 57	2
47096	07-563 081-59W	XBT	111846	1 1/2
47097	08-115 082-01W	HYDRO, STD, CDMT, SURF	112010	2
47098	08-315 082-03W	XBT	112300	4
47099	08-485 083-04E	HYDRO, D/HYDRO, STD, CDMT, SURF, MI, MI, LEX	120020	4
47100	09-123 082-05W	XBT	120730	4
47101	09-298 082-05W	HYDRO, STD, CDMT, SURF	120900	4
47102	09-463 082-07W	XBT	121214	4
47103	10-098 082-09W	HYDRO, STD, CDMT, SURF, MI, LEX	121400	3
47104	10-053 081-58W	XBT	121801	3
47105	10-023 081-58W	HYDRO, STD, CDMT, SURF	122100	2
47106	09-563 081-10W	XBT	122220	4
47107	09-503 080-53W	HYDRO, D/HYDRO, STD, CDMT, SURF, MI, LEX	130000	4
47108	09-403 080-36W	XBT	130715	4
47109	09-353 080-15W	HYDRO, STD, CDMT, SURF	130855	4
47110	09-293 080-02W	XBT	131129	5
47111	09-273 079-55W	STD	131200	3
47112	09-243 079-57W	XBT	131314	3
47113	09-223 079-59W	HYDRO, STD, CDMT, SURF, MI, LEX	131400	2 1/2
47114	09-403 079-27W	STD	131804	3
47115	09-573 079-17W	STD	131934	2
47116	10-153 079-05W	STD	132130	4
47117	10-303 078-55W	STD	132315	4
47118	10-423 078-48W	STD	140000	4
47119	10-533 078-37W	STD	140255	4
47120	11-073 078-30W	STD	140445	5
47121	11-233 078-19W	STD	140640	4
47122	11-343 078-10W	STD	140825	3
47123	11-473 077-58W	STD	141003	2 1/2
47124	12-133 077-39W	HYDRO, STD, CDMT, SURF	162035	2
47125	12-153 077-47W	XBT	162250	2
47126	12-183 077-57W	STD	162335	2 1/2
47127	12-253 076-03W	XBT	170035	2 1/2
47128	12-293 075-05W	HYDRO, D/HYDRO, STD, CDMT, SURF, MI, LEX	170115	2 1/2
47129	12-343 075-22W	XBT	170740	2 1/2
47130	12-383 075-31W	STD	170823	4
47131	12-423 075-45W	XBT	170903	4
47132	12-443 075-52W	HYDRO, STD, CDMT, SURF	170955	4
47133	12-503 075-10W	XBT	171240	4

ENCLOSURE (1)

STATION	POSITION	TYPE SURVEYS MADE	TIME (h)	POSITION ACCURACY
47134	12-568 079-28W	HYDRO, STD, OUNT, SURF, MN, LEX	171400	2 1/2
47135	13-038 079-50W	IST	171805	2
47136	13-058 079-56W	IST	171840	2 1/2
47137	13-108 080-13W	HYDRO, STD, OUNT, SURF	172020	2
47138	13-188 080-38W	IST	172325	3
47139	13-278 081-01W	HYDRO, STD, OUNT, SURF, MN, LEX	180120	4
47140	13-358 081-52W	IST	180625	4
47141	13-388 081-49W	HYDRO, STD, OUNT, SURF	180750	4
47142	13-518 082-11W	IST	181139	3
47143	13-588 082-25W	HYDRO, STD, OUNT, SURF, MN, LEX	181335	2 1/2
47144	14-098 082-47W	IST	181740	2 1/2
47145	14-128 083-05W	HYDRO, STD, OUNT, SURF	181925	2
47146	14-268 083-23W	IST	182200	2
47147	14-278 083-41W	D/HYDRO, HYDRO, STD, IST, OUNT, SURF, MN, LEX	190003	2 1/2
47148	14-398 084-06W	IST	190745	3
47149	14-438 084-21W	HYDRO, STD, OUNT, SURF	190925	4
47150	14-488 084-38W	IST	191200	3
47151	14-568 085-00W	HYDRO, STD, OUNT, SURF, MN, LEX	191400	2 1/2
47152	14-328 085-02W	IST	191830	3
47153	14-178 085-03W	HYDRO, STD, OUNT, SURF	192000	3
47154	13-558 085-02W	IST	192305	2 1/2
47155	13-358 085-00W	HYDRO, STD, OUNT, SURF, MN, LEX	200110	2 1/2
47156	13-068 085-04W	IST	200530	2
47157	12-448 085-07W	D/HYDRO, HYDRO, STD, OUNT, SURF	200715	2
47158	12-268 085-03W	IST	201302	2 1/2
47159	12-078 084-59W	HYDRO, STD, OUNT, SURF, MN, LEX	201430	2
47160	11-568 085-00W	IST	201810	2 1/2
47161	11-468 085-01W	IST	201910	2 1/2
47162	11-308 085-01W	HYDRO, STD, OUNT, SURF	202040	3
47163	11-098 085-05W	IST	202322	4
47164	10-438 085-04W	HYDRO, D/HYDRO, STD, OUNT, SURF, MN, LEX	210120	4
47165	10-208 085-05W	IST	210807	4
47166	10-018 085-05W	HYDRO, STD, OUNT, SURF	210950	4
47167	09-388 085-06W	IST	211212	4
47168	09-178 085-07W	HYDRO, STD, OUNT, SURF, MN, LEX	211438	3
47169	09-028 085-06W	IST	211757	3
47170	08-518 085-04W	IST	211855	3
47171	08-388 085-02W	HYDRO, STD, OUNT, SURF	212014	2 1/2
47172	08-148 085-03W	IST	212344	4
47173	07-558 085-09W	HYDRO, STD, OUNT, SURF, MN, US, LEX	220140	4
47174	07-348 085-06W	IST	220616	4
47175	07-168 085-07W	HYDRO, STD, OUNT, SURF	220810	4
47176	06-568 085-08W	IST	221154	2 1/2
47177	06-358 085-09W	HYDRO, STD, OUNT, SURF, MN, LEX	221408	4
47178	06-088 085-04W	IST	221834	3
47179	05-588 085-03W	HYDRO, STD, OUNT, SURF	222000	3
47180	05-328 085-01W	IST	222303	4

ENCLOSURE (1)

STATION	POSITION	TYPE SURVEYS MADE	TIME(Z)	POSITION ACCURACY
47181	05-178 085-01W	D/HYDRO, HYDRO, CUNT, SURF, MN, DR, LEX	230042	4
47182	05-058 085-00W	XBT	230625	4
47183	04-548 085-00W	STD	230645	4
47184	04-413 085-00W	XBT	230900	5
47184	04-258 085-00W	HYDRO, STD, CUNT, SURF	231000	5
47185	04-158 084-59W	XBT	231225	4
47187	04-088 084-59W	STD	231312	4
47188	03-598 085-00W	XBT	231414	3
47189	03-518 085-01W	HYDRO, STD, CUNT, SURF, MN, LEX	231500	2
47190	03-368 085-01W	XBT	231823	2
47191	03-268 085-01W	STD	231923	14
47192	03-128 085-01W	XBT	232038	24
47193	02-598 085-01W	HYDRO, STD, CUNT, SURF	232140	3
47194	02-478 085-01W	XBT	232355	3
47195	02-388 085-01W	STD	240050	3
47196	02-228 085-02W	XBT	240206	4
47197	02-108 085-03W	HYDRO, STD, CUNT, SURF, MN, DR, LEX	240300	4
47198	01-568 085-03W	XBT	240638	4
47199	01-508 085-03W	STD	240725	4
47200	01-388 085-03W	XBT	240830	4
47201	01-268 085-04W	HYDRO, STD, CUNT, SURF	240840	4
47202	01-128 085-02W	XBT	241207	4
47203	01-038 085-04W	STD	241257	3
47204	00-518 085-04W	XBT	241405	3
47205	00-408 085-04W	HYDRO, STD, CUNT, SURF, MN, LEX	241500	24
47206	00-268 085-03W	XBT	241805	2
47207	00-178 085-02W	STD	241910	24
47208	00-098 085-00W	XBT	242020	3
47209	00-038 084-59W	HYDRO, STD, CUNT, SURF	242100	3
47210	00-118 084-56W	XBT	242307	4
47211	00-23W 084-56W	STD	242355	4
47212	00-36W 084-56W	XBT	250056	4
47213	00-47W 084-55W	HYDRO, D/HYDRO, STD, CUNT, SURF, MN, DR, LEX	250145	5
47214	01-00W 084-55W	XBT	250706	4
47215	01-09W 084-55W	STD	250810	4
47216	01-21W 084-59W	XBT	250925	4
47217	01-31W 084-59W	HYDRO, STD, CUNT, SURF	251020	3
47218	01-41W 084-59W	XBT	251229	3
47219	01-51W 084-55W	STD	251327	2
47220	02-03W 084-57W	XBT	251433	24
47221	02-08W 084-57W	HYDRO, STD, CUNT, SURF, MN, LEX	251500	24
47222	02-18W 084-57W	XBT	251757	2
47223	02-28W 084-57W	STD	251900	2
47224	02-38W 084-58W	XBT	252030	2
47225	02-47W 084-57W	HYDRO, STD, CUNT, SURF	252130	24
47226	03-59W 084-58W	XBT	260005	2
47227	03-10W 084-57W	STD	260106	2

ENCLOSURE (1)

STATION	POSITION	TYPE SURVEYS MADE	TIME(Z)	POSITION ACCURACY
47228	03-21N 084-53W	ZBT	260205	3
47229	03-33N 084-54W	HYDRO, STD, COUNT, SURF, HW, LW, LWT	260303	3
47230	03-49N 084-52W	ZBT	260544	4
47231	03-56N 084-52W	STD	260729	4
47232	04-07N 084-51W	ZBT	260833	4
47233	04-21N 084-49W	HYDRO, STD, COUNT, SURF	260930	4
47234	04-32N 084-47W	ZBT	261200	4
47235	04-44N 084-46W	STD	261253	4
47236	04-56N 084-45W	ZBT	261410	3
47237	05-07N 084-45W	HYDRO, STD, COUNT, SURF, HW, LW, LWT	261500	2
47238	05-17N 084-45W	ZBT	261800	2
47239	05-24N 084-50W	ZBT	261847	3
47240	05-41N 084-57W	HYDRO, STD, COUNT, SURF	262030	3
47241	06-02N 084-55W	ZBT	262330	3
47242	06-21N 084-55W	S/HYDRO, HYDRO, STD, COUNT, SURF, HW, LW, LWT	270110	4
47243	06-42N 084-54W	ZBT	270644	4
47244	06-59N 084-54W	HYDRO, STD, COUNT, SURF	270845	4
47245	07-19N 084-52W	ZBT	271220	3
47246	07-43N 085-00W	HYDRO, STD, COUNT, SURF, HW, LW, LWT	271550	3
47247	07-56N 085-00W	ZBT	271801	3
47248	08-04N 085-06W	STD	271900	3
47249	08-17N 085-05W	ZBT	272027	4
47250	08-27N 085-05W	HYDRO, STD, COUNT, SURF	272120	4
47251	08-37N 085-06W	ZBT	272338	3
47252	08-46N 085-07W	STD	280030	3
47253	08-51N 085-09W	ZBT	280115	3
47254	08-57N 085-01W	HYDRO, STD, COUNT, SURF, HW, LW, LWT	280200	3
47255	09-08N 084-57W	KRI	280327	3
47256	09-15N 084-55W	STD	280623	4
47257	09-22N 084-53W	ZBT	280710	3
47258	09-27N 084-52W	HYDRO, STD, COUNT, SURF	280730	2
47259	09-59N 085-52W	STD	302300	2
47260	10-13N 085-06W	STD	310239	3
47261	10-25N 085-21W	STD	310314	3
47262	10-41N 085-36W	STD	310355	3
47263	10-58N 085-51W	STD	310531	4
47264	11-09N 087-07W	STD	310706	4
47265	11-22N 087-21W	STD	310845	4
47266	11-36N 087-30W	STD	311010	3
47267	11-50N 087-51W	STD	311140	4
47268	11-58N 088-02W	HYDRO, STD, COUNT, SURF, HW, LW, LWT	311535	3
47269	11-50N 088-02W	ZBT	311630	3
47270	11-44N 088-02W	STD	311915	3
47271	11-34N 088-02W	ZBT	312024	3
47272	11-21N 088-01W	HYDRO, STD, COUNT, SURF	312130	3
47273	11-13N 088-02W	ZBT	312333	4
47274	11-04N 088-02W	STD	312533	4
47275	10-59N 088-07W	ZBT	010026	4
			010134	4

ENCLOSURE (1)

STATION	POSITION	TYPE SURVEYS MADE	TIME(S)	POSITION ACCURACY
47276	10-54N 085-10W	D/HYDRO, HYDRO, STD, XBT, CMT, SURF, MW, LEX	010220	5
47277	10-36N 085-14W	XBT	010822	5
47278	10-21N 085-18W	HYDRO, STD, CMT, SURF	011005	4
47279	09-55N 085-15W	XBT	011439	4
47280	09-45N 085-14W	HYDRO, STD, CMT, SURF, MW, LEX	011555	3
47281	09-40N 085-13W	XBT	011908	3
47282	09-27N 085-10W	XBT	012010	2 1/2
47283	09-04N 085-04W	HYDRO, STD, CMT, SURF	012200	2
47284	08-57N 085-03W	XBT	020002	2 1/2
47285	08-44N 087-59W	XBT	020107	3
47286	08-15N 087-52W	HYDRO, STD, CMT, SURF, MW, LEX	020340	3
47287	07-51N 087-45W	XBT	020813	4
47288	07-29N 087-44W	HYDRO, STD, CMT, SURF	021030	4
47289	07-23N 087-46W	XBT	021215	3
47290	06-47N 087-57W	HYDRO, STD, CMT, SURF, MW, LEX	021610	2 1/2
47291	06-21N 087-57W	XBT	022030	3
47292	06-02N 087-57W	HYDRO, STD, CMT, SURF	022215	6
47293	05-57N 087-57W	XBT	030002	4
47294	05-38N 087-57W	XBT	030130	4
47295	05-16N 087-57W	HYDRO, D/HYDRO, STD, CMT, SURF, MW, LEX	030315	4
47296	05-02N 087-54W	XBT	040245	4
47297	04-36N 087-58W	HYDRO, STD, CMT, SURF, MW, LEX	040500	4
47298	04-25N 087-57W	XBT	040815	4
47299	04-19N 088-00W	STD	040904	4
47300	04-10N 088-02W	XBT	041000	4
47301	04-03N 088-02W	HYDRO, STD, CMT, SURF	041045	4
47302	03-41N 088-05W	STD	041330	3
47303	03-32N 088-04W	XBT	041430	3
47304	03-22N 088-04W	HYDRO, STD, CMT, SURF, MW, LEX	041515	2 1/2
47305	03-02N 088-02W	STD	041910	2 1/2
47306	02-45N 087-59W	HYDRO, STD, CMT, SURF	042050	2 1/2
47307	02-34N 087-59W	XBT	042255	3
47308	02-24N 088-00W	STD	042352	3
47309	02-12N 088-02W	XBT	050056	4
47310	02-02N 088-03W	HYDRO, D/HYDRO, STD, CMT, SURF, MW, LEX	050145	4
47311	01-48N 088-04W	XBT	050606	4
47312	01-40N 088-04W	STD	050655	4
47313	01-28N 088-05W	XBT	050803	4
47314	01-18N 088-08W	HYDRO, STD, CMT, SURF	050856	3
47315	01-04N 088-07W	XBT	051125	2
47316	00-54N 088-07W	STD	051212	2 1/2
47317	00-44N 088-05W	XBT	051335	2
47318	00-34N 088-02W	HYDRO, STD, CMT, SURF, MW, LEX	051540	2 1/2
47319	00-21N 088-02W	XBT	051753	3
47320	00-10N 088-02W	STD	051905	3
47321	00-04N 088-08W	XBT	052020	4
47322	00-14N 088-08W	HYDRO, STD, CMT, SURF	052103	4

ENCLOSURE (1)

STATION	POSITION	TYPE SURVEYS MADE	TIME (A)	POSITION ACCURACY
47323	00-248 088-07W	XBT	052355	4
47324	00-368 088-09W	STD	060056	5
47325	00-488 088-05W	XBT	060209	3
47326	00-598 088-07W	HYDRO, STD, CDMT, SURF, MN, LEX	060305	4
47327	01-098 088-06W	XBT	060635	4
47328	01-248 088-05W	STD	060730	3
47329	01-358 088-07W	XBT	060835	3
47330	01-458 088-08W	HYDRO, STD, CDMT, SURF	060935	3
47331	01-578 088-07W	XBT	061215	
47332	02-078 088-06W	STD	061305	3
47333	02-188 088-03W	XBT	061430	
47334	02-248 088-02W	HYDRO, STD, CDMT, SURF, MN, LEX	061500	2
47335	02-358 088-03W	XBT	061812	
47336	02-438 088-03W	XBT	061937	3
47337	02-578 088-03W	XBT	062040	
47338	03-048 088-04W	HYDRO, XBT, CDMT, SURF	062120	4
47339	03-158 088-04W	XBT	062327	
47340	03-248 088-04W	XBT	070005	
47341	03-338 088-04W	XBT	070054	
47342	03-488 088-04W	D/HYDRO, HYDRO, STD, CDMT, SURF, MN, LEX	070205	4
47343	04-028 088-06W	XBT	070735	
47344	04-088 087-59W	STD	070816	4
47345	04-298 087-57W	HYDRO, STD, CDMT, SURF	071020	3
47346	04-388 087-58W	XBT	071237	
47347	04-488 087-59W	STD	071325	4
47348	04-578 088-00W	XBT	071433	
47349	05-108 088-02W	HYDRO, STD, CDMT, SURF, MN, LEX	071540	3
47350	05-358 088-00W	XBT	072015	
47351	05-538 087-59W	HYDRO, STD, CDMT, SURF	072210	3
47352	05-598 087-59W	XBT	072359	
47353	06-158 087-59W	XBT	080123	
47354	06-378 087-59W	HYDRO, STD, CDMT, SURF, MN, LEX	080320	4
47355	06-478 088-00W	XBT	080613	
47356	06-598 088-00W	XBT	080727	
47357	07-188 088-01W	HYDRO, STD, CDMT, SURF	080918	5
47358	07-378 088-02W	XBT	081221	
47359	08-078 088-03W	HYDRO, STD, CDMT, SURF, MN, LEX	081515	3
47360	08-268 088-04W	XBT	081835	
47361	08-348 088-04W	XBT	081915	
47362	08-558 088-04W	HYDRO, STD, CDMT, SURF	082120	4
47363	09-178 088-05W	XBT	090050	
47364	09-408 088-02W	HYDRO, STD, CDMT, SURF, MN, LEX	090235	4
47365	09-578 088-02W	XBT	090610	
47366	10-078 088-02W	XBT	090720	
47367	10-228 088-02W	HYDRO, STD, CDMT, SURF	090900	5
47368	10-428 088-00W	XBT	091222	
47369	11-028 087-58W	HYDRO, STD, CDMT, SURF, MN, LEX	091430	4
47370	11-278 087-59W	XBT	091630	
47371	11-488 087-00W	HYDRO, STD, CDMT, SURF	092030	3

ENCLOSURE (1)

STATION	POSITION	TYPE SURVEYS MADE	TDS(2)	POSITION ACCURACY
47372	12-08S 088-02W	XBT	092355	
47373	12-31S 088-03W	D/HYDRO, STD, HYDRO, OBT, SURF MM, LEX	100205	3
47374	12-41S 088-03W	XBT	100645	
47375	12-59S 088-02W	XBT	100830	
47376	13-14S 088-01W	HYDRO, STD, OBT, SURF	101000	4
47377	13-27S 088-00W	XBT	101233	
47378	13-43S 087-58W	XBT	101400	
47379	13-57S 087-57W	HYDRO, STD, OBT, SURF, MM, LEX	101527	2
47380	14-14S 087-57W	XBT	101845	
47381	14-31S 087-58W	XBT	102015	
47382	14-47S 087-59W	HYDRO, STD, OBT, SURF	102150	3
47383	14-57S 088-16W	STD	110039	3
47384	14-57S 088-38W	STD	110228	6
47385	14-58S 088-59W	STD	110411	4
47386	14-59S 089-20W	STD	110554	5
47387	14-59S 089-40W	STD	110741	5
47388	14-59S 090-01W	STD	110930	3
47389	15-00S 090-23W	STD	111100	4
47390	15-00S 090-45W	STD	111315	6
47391	15-00S 091-07W	STD	111510	3
47392	14-57S 091-28W	STD	111700	3
47393	14-57S 091-50W	STD	111850	3
47394	14-58S 092-10W	STD	112035	4
47395	14-59S 092-31W	STD	112223	3
47396	14-59S 092-52W	STD	120018	3
47397	15-00S 093-14W	STD	120157	2
47398	14-59S 093-34W	STD	120340	3
47399	14-59S 093-54W	STD	120525	6
47400	14-59S 094-15W	STD	120710	6
47401	14-59S 094-38W	STD	120859	4
47402	14-58S 095-01W	HYDRO, STD, OBT, SURF	121100	4
47403	14-37S 095-03W	XBT	121410	
47404	14-17S 095-03W	HYDRO, STD, SURF, MM, LEX	121552	3
47405	12-05S 095-03W	XBT	121836	
47406	13-51S 095-03W	XBT	121955	
47407	13-37S 095-02W	HYDRO, STD, SURF	122125	4
47408	13-15S 095-01W	XBT	122349	
47409	12-57S 095-00W	XBT	130112	
47410	12-51S 094-59W	D/HYDRO, HYDRO, STD, SURF, MM, LEX	130150	4
47411	12-37S 095-00W	XBT	130408	
47412	12-21S 095-00W	XBT	130725	
47413	12-03S 095-01W	HYDRO, STD, SURF	130900	4
47414	11-36S 095-02W	XBT	131145	
47415	11-07S 095-02W	HYDRO, STD, OBT, SURF, MM, LEX	131335	3
47416	10-42S 095-02W	XBT	131800	
47417	10-24S 095-02W	XBT	131920	
47418	10-05S 095-02W	XBT	132040	
47419	09-47S 095-02W	XBT	132150	
47420	09-26S 095-02W	XBT	132315	

ENCLOSURE (1)

<u>STATION</u>	<u>POSITION</u>	<u>TYPE SURVEYS MADE</u>	<u>TIME (S)</u>	<u>POSITION ACCURACY</u>
47421	09-043 095-02W	XBT	140042	
47422	08-45S 095-02W	XBT	140000	
47423	08-24S 095-02W	XBT	140320	
47424	08-05S 095-02W	XBT	140437	
47425	07-46S 095-02W	XBT	140555	
47426	07-26S 095-02W	XBT	140715	
47427	07-06S 095-02W	XBT	140838	
47428	06-44S 095-02W	XBT	141005	
47429	06-25S 095-02W	XBT	141120	
47430	09-27S 095-05W	HYDRO, STD, CONT, SURF, W, LAX	150320	4
47431	09-55S 095-01W	XBT	150735	
47432	10-15S 095-02W	HYDRO, STD, CONT, SURF	150938	4
47433	09-54S 095-02W	XBT	151225	
47434	09-26S 095-02W	XBT	151440	
47435	08-42S 095-01W	XBT	151802	
47436	08-32S 095-02W	HYDRO, STD, LEX, CONT, SURF	151900	2
47437	08-04S 095-05W	XBT	152250	
47438	07-40S 095-05W	U/HYDRO, HYDRO, STD, LEX, W, CONT, SURF	160055	4
47439	07-07S 095-05W	XBT	160740	
47440	06-46S 095-05W	HYDRO, STD, CONT, SURF	160945	4
47441	06-27S 095-05W	XBT	161230	
47442	06-12S 095-05W	XBT	161345	
47443	05-55S 095-08W	HYDRO, STD, LEX, W, CONT, SURF	161515	3
47444	05-38S 095-07W	XBT	161845	
47445	05-20S 095-06W	XBT	162015	
47446	05-02S 095-06W	HYDRO, STD, CONT, SURF	162153	3
47447	04-51S 095-06W	XBT	170003	
47448	04-38S 095-06W	STD	170103	2
47449	04-26S 095-03W	XBT	170213	
47450	04-14S 095-01W	HYDRO, STD, LEX, W, CONT, SURF	170304	3
47451	03-59S 095-01W	XBT	170620	
47452	03-50S 095-01W	STD	170719	4
47453	03-38S 095-01W	XBT	170827	
47454	03-27S 095-01W	HYDRO, STD, CONT, SURF	170925	3
47455	03-15S 095-07W	XBT	171145	
47456	03-03S 095-00W	STD	171242	3
47457	02-51S 095-00W	XBT	171345	
47458	02-41S 095-00W	HYDRO, STD, LEX, W, CONT, SURF	171425	3
47459	02-28S 095-01W	XBT	171745	
47460	02-19S 095-01W	STD	171842	3
47461	02-05S 095-02W	XBT	171945	
47462	01-54S 095-04W	HYDRO, STD, CONT, SURF	172040	4
47463	01-42S 095-03W	XBT	172301	
47464	01-31S 095-03W	STD	172358	4
47465	01-18S 095-05W	XBT	180405	
47466	01-01S 095-09W	HYDRO, U/HYDRO, STD, LEX, W, CONT, SURF	180240	3
47467	00-50S 095-08W	XBT	180937	
47468	00-40S 095-08W	STD	183912	3

ENCLOSURE (1)

STATION	POSITION	TYPE SURVEYS MADE	TIME(Z)	POSITION ACCURACY
47469	00-33S 095-09W	XBT	181015	
47470	00-24S 095-09W	HYDRO, STD, CUNT, SURF	181055	4
47471	00-13S 095-10W	XBT	181323	
47472	00-05S 095-09W	STD	181410	4
47473	00-11S 095-08W	XBT	181532	
47474	00-23S 095-07W	HYDRO, STD, LEX, MW, CUNT, SURF	181630	3
47475	00-37S 095-06W	XBT	182000	
47476	00-44S 095-02W	STD	182044	3
47477	00-56S 095-00W	XBT	182150	
47478	01-05N 094-58W	HYDRO, STD, CUNT, SURF	182240	4
47479	01-16N 094-56W	XBT	190103	
47480	01-27N 094-53W	STD	190200	4
47481	01-39N 094-51W	XBT	190307	
47482	01-48N 094-49W	HYDRO, STD, LEX, MW, CUNT, SURF	190300	4
47483	02-02N 094-46W	XBT	190706	
47484	02-09N 094-45W	STD	190754	4
47485	02-22N 094-43W	XBT	190910	
47486	02-33S 094-42W	HYDRO, STD, CUNT, SURF	191000	4
47487	02-44S 094-41W	XBT	191215	
47488	02-53S 094-39W	STD	191308	4
47489	03-06N 094-41W	XBT	191615	
47490	03-16N 094-41W	HYDRO, STD, LEX, MW, CUNT, SURF	191504	3
47491	03-28S 094-47W	XBT	191800	
47492	03-38S 094-51W	STD	191902	2 1/2
47493	03-47N 094-54W	XBT	192003	
47494	03-58N 094-59W	HYDRO, STD, CUNT, SURF	192058	3
47495	04-11N 094-55W	XBT	192255	
47496	04-21N 094-59W	STD	192348	4
47497	04-33N 094-57W	XBT	200053	
47498	04-44S 094-56W	D/HYDRO, HYDRO, CUNT, SURF, STD, MW, LEX	200155	4
47499	05-02S 094-58W	XBT	200648	
47500	05-13N 094-56W	XBT	200745	
47501	05-36S 095-56W	HYDRO, STD, CUNT, SURF	200945	4
47502	05-54N 094-57W	XBT	201247	
47503	06-12N 094-58W	XBT	201410	
47504	06-27N 094-59W	HYDRO, STD, LEX, MW, CUNT, SURF	201525	4
47505	06-46S 094-58W	XBT	201840	
47506	07-05N 094-57W	XBT	203015	
47507	07-14N 094-58W	HYDRO, STD, CUNT, SURF	203125	5
47508	07-44N 095-00W	XBT	210036	
47509	08-05N 095-02W	HYDRO, STD, LEX, MW, CUNT, SURF	210230	5
47510	08-35N 095-03W	XBT	210645	
47511	08-57N 095-04W	HYDRO, STD, CUNT, SURF	210835	4
47512	09-24N 095-04W	XBT	211200	
47513	09-49N 095-05W	HYDRO, STD, CUNT, SURF, LEX, MW	211355	3
47514	10-18N 095-05W	XBT	211805	
47515	10-45N 095-06W	HYDRO, STD, CUNT, SURF	212025	3
47516	11-11N 095-03W	XBT	212329	
47517	11-36S 095-01W	HYDRO, D/HYDRO, STD, LEX, MW, CUNT, SURF	220130	2

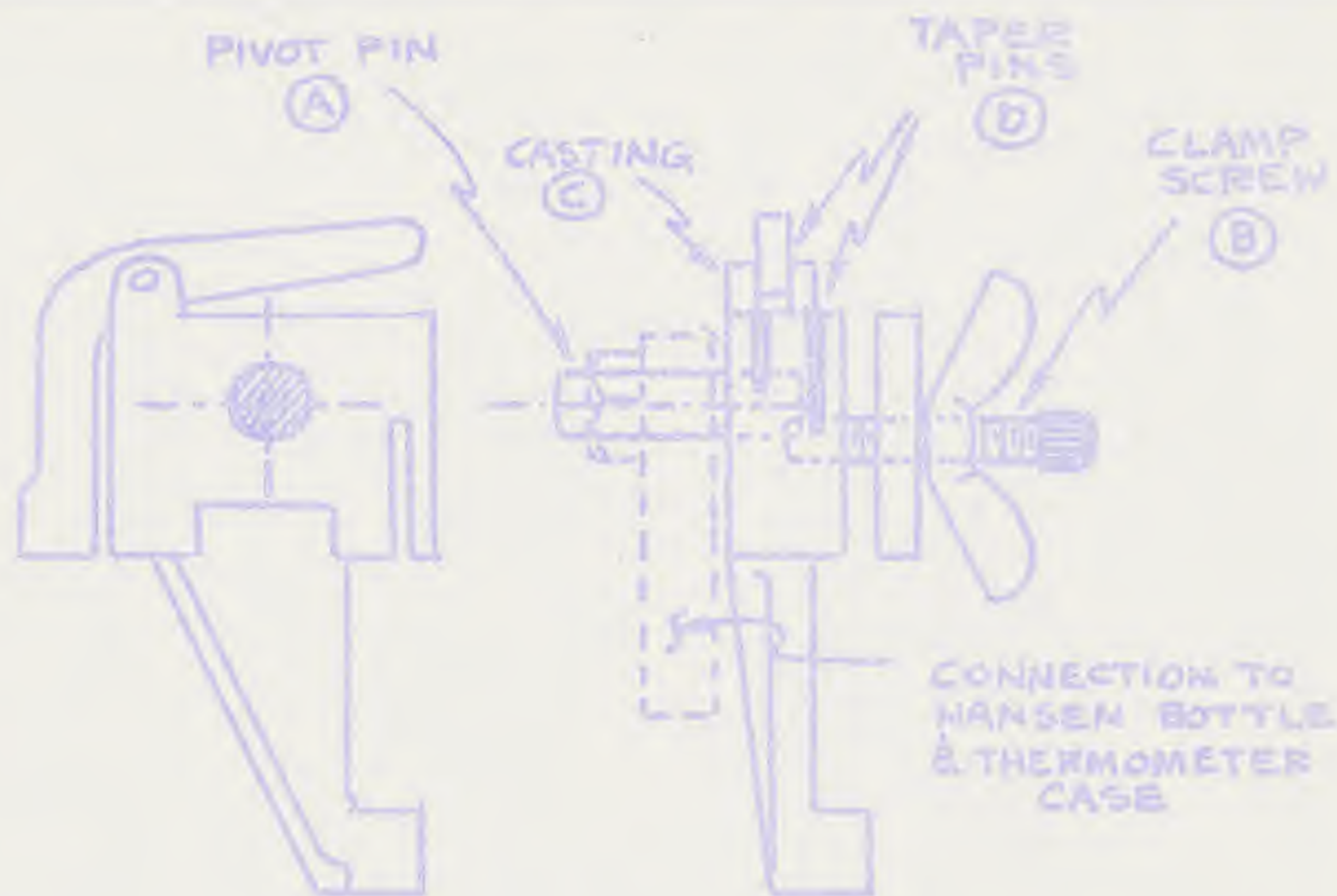
ENCLOSURE (1)

<u>STATION</u>	<u>POSITION</u>	<u>TYPE SURVEYS MADE</u>	<u>TIME(Z)</u>	<u>POSITION ACCURACY</u>
47518	11-55N 095-00W	IBT	220637	
47519	12-05N 094-59W	IBT	220744	
47520	12-33N 094-57W	HYDRO, STD, ODN, SURF	220942	4
47521	12-47N 094-55W	IBT	221205	
47522	13-03N 095-00W	IBT	221315	
47523	13-16N 095-01W	HYDRO, STD, LEX, MS, ODN, SURF	221418	3
47524	13-45N 095-02W	IBT	221825	
47525	14-11N 095-01W	HYDRO, STD, ODN, SURF	222030	3
47526	14-38N 095-00W	IBT	222345	
47527	15-00N 094-59W	HYDRO, STD, ODN, SURF, LEX, MS	230125	4
47528	14-51N 094-33W	IBT	230507	
47529	14-46N 094-15W	IBT	230625	
47530	14-40N 093-58W	IBT	230745	
47531	14-34N 093-37W	IBT	230910	
47532	14-28N 093-19W	IBT	231022	
47533	14-23N 093-02W	IBT	231140	
47534	14-17N 092-44W	IBT	231300	

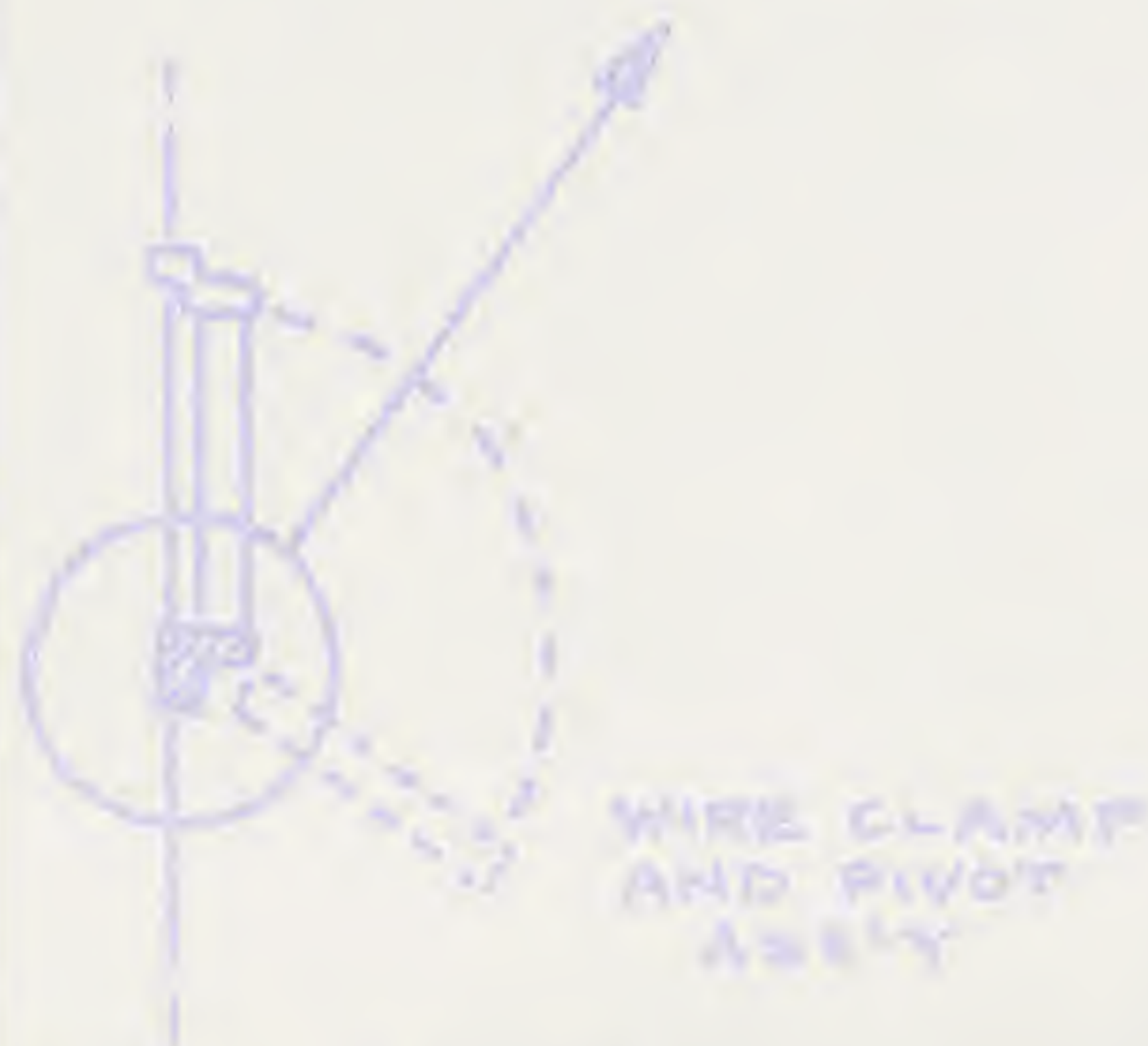
ENCLOSURE (1)



ENCLOSURE II



Pivot Pin (A) and Clamp Screw (B) are pressed-fit into Casting (C). If the pressed-fit on either (A) or (B) works loose, the Nansen bottle, the thermometer case, and the thermometers are lost. Drilling of the Casting (C) and installation of the Taper Pins (D) prevents this type of failure.



ENCLOSURE III

USCGC ROCKAWAY WAGB-377	
MODIFICATION TO NANSEN BOTTLE	
NO SCALE	5 OCT. 1967

USCGC ROCKAWAY

OCEANO. STATION POSITION REPORT

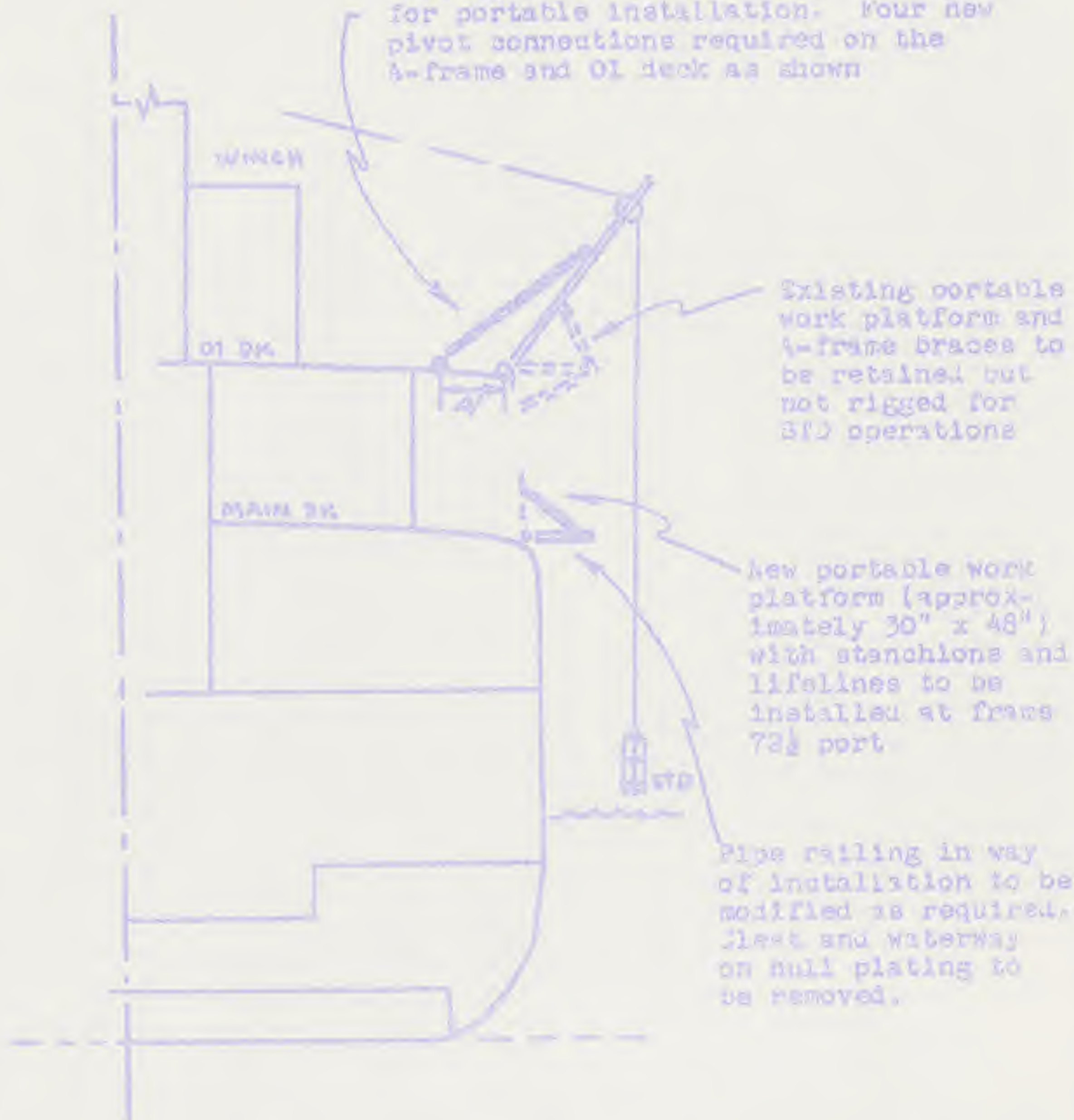
DATE

STATION	NR _____ (NR/SHIP _____)
TIME	STATION COMMENCED _____ LZT (ZONE _____) STATION COMPLETED _____ LZT TIME ON STATION _____ HRS. _____ MINS.
POSITION	LATITUDE _____ LONGITUDE _____ ESTIMATED ACCURACY \pm _____ MILES

O. O. P.

NAVIGATOR

Two new braces (1 1/2" Std. pipe approximately 10 feet long) to be fabricated for portable installation. Four new pivot connections required on the A-frame and OI deck as shown



USCGC ROCKAWAY
WAGO-377

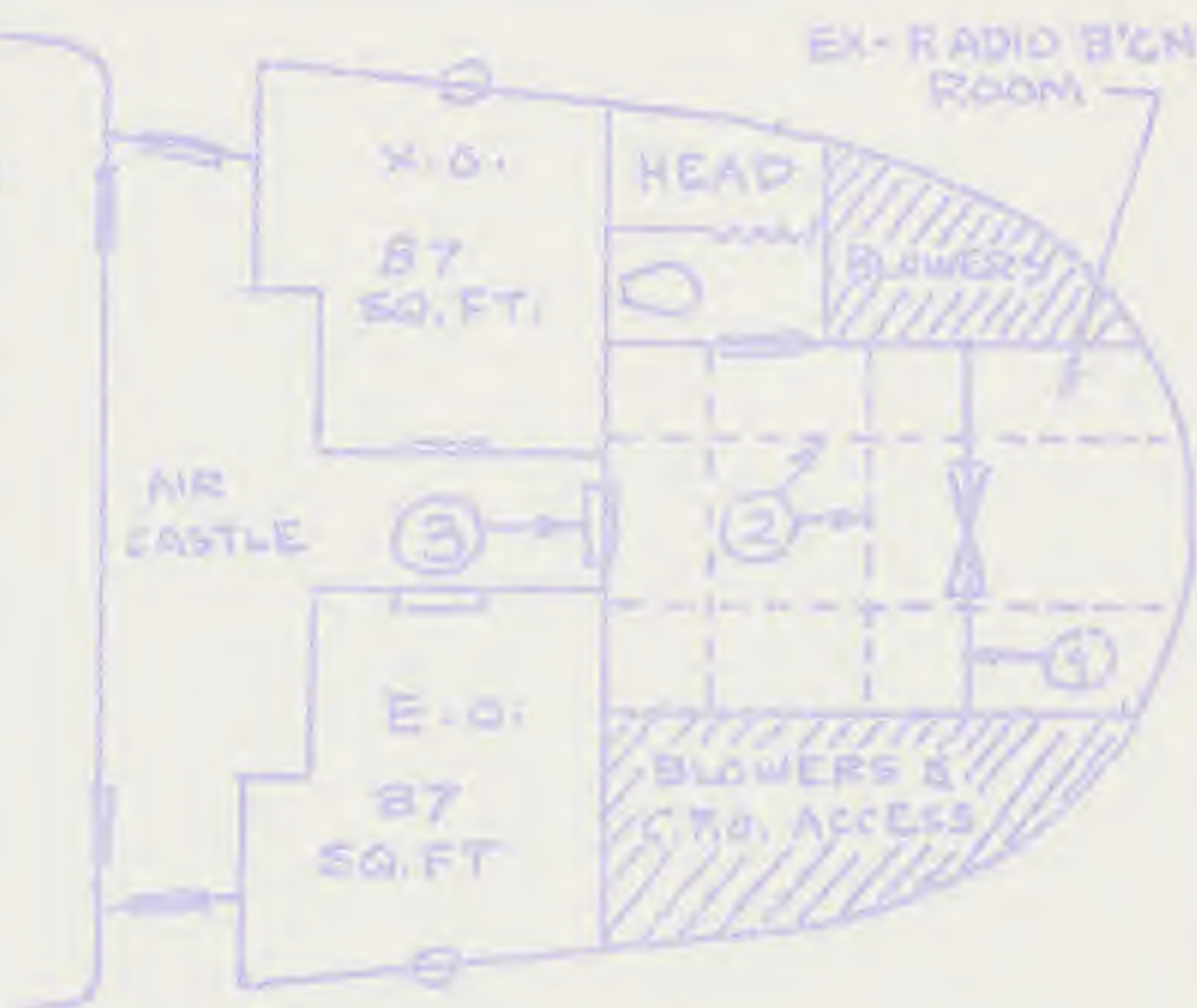
PROPOSED MODIFICATIONS
TO STD HANDLING SYSTEM

SCALE
1/8" = 1'

5 OCT 1967

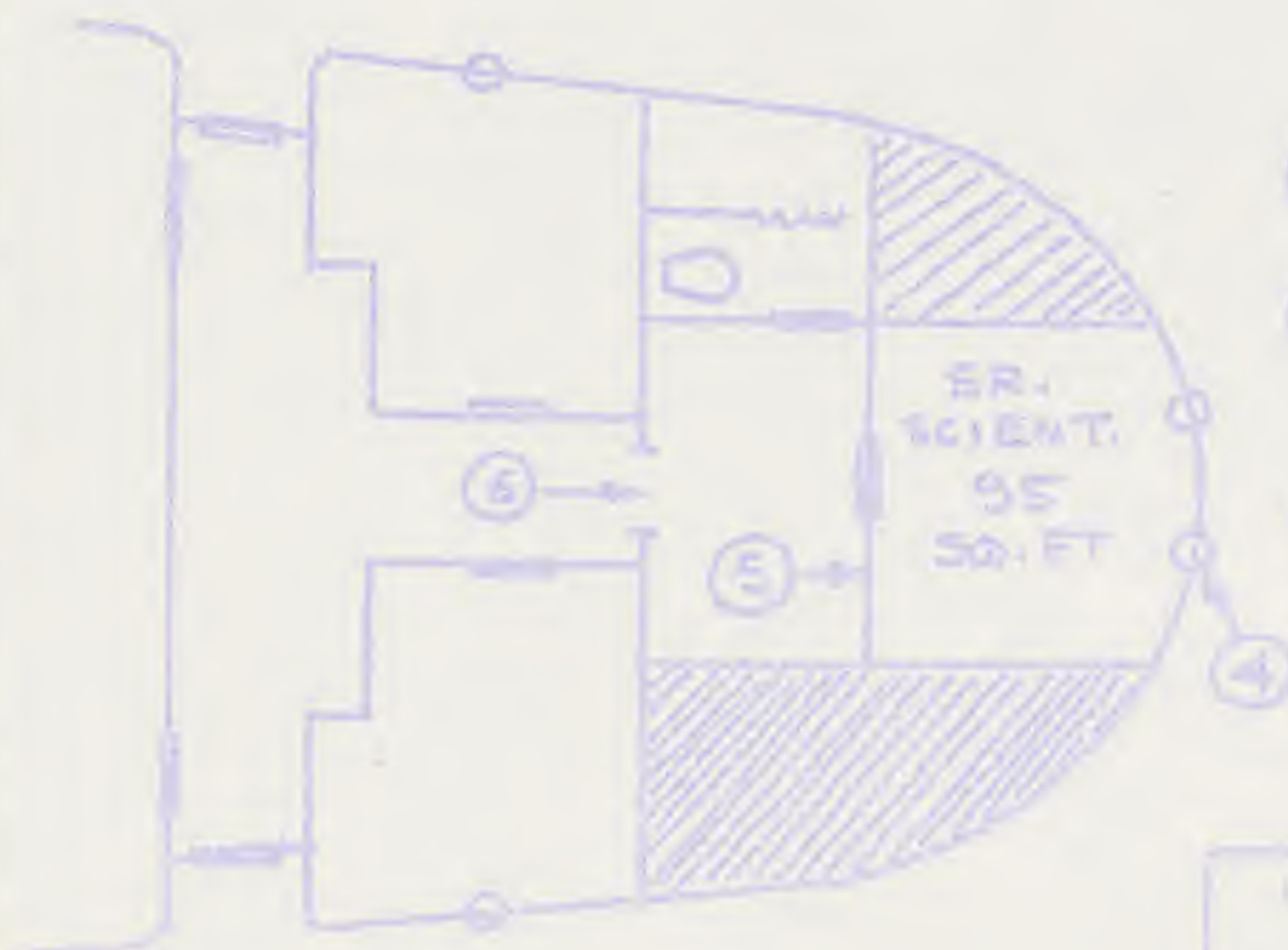
ENCLOSURE II

- ① REMOVE W.T. BULK-HEAD AND W.T. DOOR
- ② REMOVE DEEP WEB BEAMS FROM OVER-HEAD
- ③ REMOVE W.T. DOOR AND COAMING



BEFORE

MAIN DECK- FRAMES 29- 44



AFTER

- ④ INSTALL TWO PORT LIGHTS
- ⑤ INSTALL JOINER BULKHEAD AND JOINER DOOR
- ⑥ INSTALL ARCH-WAY

USCGC ROCKAWAY
WAGO 377

PROPOSED
SR. SCIENTIST
QUARTERS

SCALE:
 $1/8" = 1'$

5 OCT 1967

Date 31 July 1967 Ship Rockaway WAGO 377 Cruise No. 47
Organization USCGC Recorder _____

Sunrise: Time 0656 Position: Lat. _____, Long. LANI

Sunset: Time 1837 Position: Lat. 08°34.5', Long. 79°28'W

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = _____

Miles travelled from sunset to 2400 hours = 56.3 mi

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	<u>0800</u>		<u>6°35.0'N</u>	<u>78°24.0'W</u>
2.	<u>1000</u>		<u>5°5'</u>	
3.				
4.	<u>1830</u>	<u>range-brg-radar</u>	<u>08°34.5'N</u>	<u>79°28'W</u>
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100						
0200						
0300						
0400						
0500						
0600						
0700						
0800						
0900						
1000						
1100						
1200						
1300						
1400						
1500						
1600	<u>Redman Naval Base Canal Zone</u>					
1700	<u>08°49.5'</u>	<u>79°29.5'</u>	<u>300</u>	<u>03</u>	<u>195</u>	<u>2</u>
1800	<u>08 39</u>	<u>79°25.5'</u>	<u>300</u>	<u>02</u>	<u>195</u>	<u>2</u>
1900	<u>08 27</u>	<u>79°19'</u>	<u>300</u>	<u>02</u>	<u>195</u>	<u>2</u>
2000	<u>08°16.7'</u>	<u>79°13.7'</u>	<u>003</u>	<u>13</u>	<u>195</u>	<u>2</u>
2100	<u>08°08.2'</u>	<u>79°09.8'</u>	<u>003</u>	<u>13</u>	<u>195</u>	<u>2</u>
2200	<u>07°58.2'N</u>	<u>79°05.2'W</u>	<u>003</u>	<u>13</u>	<u>195</u>	<u>2</u>
2300	<u>07°50.8'N</u>	<u>79°01.7'W</u>	<u>355</u>	<u>11</u>	<u>195</u>	<u>2</u>
2400	<u>07°38.2'N</u>	<u>79°55.2'W</u>	<u>055</u>	<u>10</u>		

Date 1 AUG 1967 Ship ROCKAWAY (W377) Cruise No.

Organization USCG Recorder

Sunrise: Time 0608 Position: Lat. 06 54, Long. 78 31 LANI

Sunset: Time 1837 Position: Lat. 05 38, Long. 77 48

Miles travelled from 0000 hours to sunrise = 51

Miles travelled from sunrise to sunset = 108.8

Miles travelled from sunset to 2400 hours = 23

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	Celestial	6°35'N	78°24'W
2.	1204	Electronic	5°54.7'N	78°05'W
3.	2606	Electronic	5°39.5'N	77°47.0'W
4.	2400	"	6°02'N	78°19.5'W
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	07°28.5'N	78°50.8'W	055	10	—	—
0200	07°20.5'N	78°46.8'W	125	15	—	—
0300	07°11.6'N	78°42.2'W	150	11	—	—
0400	07 10	78 37 W	150	5	150	1
0500	07 05	78 34	135	8	150	1
0600	06 54	78 31	115	7	220	2
0700	6°43'	78°27.5'	53215	6	230	1
0800	6°35'	78°24'	215	6	230	1
0900	6°22.2'	78°19.5'	215	6	230	1
1000	6°14.5'N	78°14.2'	181	6	230	1
1100	6°06'N	78°10.1'W	181	6	230	1
1200	5°54.1'N	78°05'W	180	6	245	1
1300	5°47'N	78°02'W	170	5	210	1
1400	5°39.6'N	77°51'W	170	5	210	1
1500	5°32.5'N	77°51'W	210	5	210	1
1600	05 38 S	77 48	245	5	210	1
1700	001	Station	245	7	245	1
1800	"	"	240	6	245	1
1900	"	"	—	—	245	1
2000	5°39'N	77°47'W	240	10	245	1
2100	5°42.3'N	77°54'W	240	10	245	1
2200	5°49.8'N	78°03'W	240	10	245	1
2300	5°49.6'N	78°06.4'W	240	10	245	1
2400	6°02'N	78°19.5'W	240	10	—	—

Date 2 AUG 67 Ship ROCKAWAY (W377) Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0600⁰⁹ Position: Lat. 06 25, Long. 78 41 ¹²²⁰ LAN

Sunset: Time 1837 Position: Lat. 07° 12', Long. 79 49

Miles travelled from 0000 hours to sunrise = 8.5

Miles travelled from sunrise to sunset = 73

Miles travelled from sunset to 2400 hours = 72.3⁴⁴

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	<u>0800</u>	<u>Electronic</u>	<u>6° 38' N</u>	<u>78° 56' W</u>
2.	<u>0000 3 AUG</u>	<u>7° N</u>	<u>80° 57' W</u>	<u>Radar</u>
3.				
4.	<u>1844</u>	<u>Radar range</u> <u>visual bkg</u>	<u>07° 15'</u>	<u>79 53</u>
5.	<u>2000</u>	<u>Visual</u> <u>Radar</u>	<u>7° 08' N</u>	<u>80° 12.5' W</u>

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	<u>06° 03.2' N</u>	<u>78° 21.7' W</u>	<u>235</u>	<u>8</u>	<u>—</u>	<u>—</u>
0200	<u>6° 07' N</u>	<u>78° 21' W</u>	<u>220</u>	<u>10</u>	<u>—</u>	<u>—</u>
0300	<u>6° 12' N</u>	<u>78° 24' W</u>	<u>220</u>	<u>10</u>	<u>—</u>	<u>—</u>
0400	<u>06 23.0</u>	<u>78 33.0 W</u>	<u>220</u>	<u>15</u>	<u>—</u>	<u>—</u>
0500	<u>06 25</u>	<u>78 44 W</u>	<u>220</u>	<u>15</u>	<u>220</u>	<u>1</u>
0600	<u>06 25</u>	<u>78 41</u>	<u>220</u>	<u>8</u>	<u>220</u>	<u>1</u>
0700	<u>STATION</u>		<u>020</u>	<u>7</u>	<u>220</u>	<u>1</u>
0800	<u>6° 38'</u>	<u>78° 56'</u>	<u>020</u>	<u>7</u>	<u>210</u>	<u>1</u>
0900	<u>6° 44'</u>	<u>79° 01' W</u>	<u>340</u>	<u>8</u>	<u>315</u>	<u>1</u>
1000	<u>6° 55.6</u>	<u>79° 13' W</u>	<u>340</u>	<u>8</u>	<u>315</u>	<u>2</u>
1100	<u>6° 50' N</u>	<u>79° 16' W</u>	<u>340</u>	<u>5</u>	<u>315</u>	<u>2</u>
1200	<u>6° 50' N</u>	<u>79° 17' W</u>	<u>320</u>	<u>15</u>	<u>320</u>	<u>2</u>
1300	<u>6° 48' N</u>	<u>79° 16' W</u>	<u>320</u>	<u>10</u>	<u>320</u>	<u>2</u>
1400	<u>6° 45.9' N</u>	<u>79° 17' W</u>	<u>320</u>	<u>8</u>	<u>340</u>	<u>2</u>
1500	<u>6° 51' N</u>	<u>79° 21' W</u>	<u>320</u>	<u>8</u>	<u>330</u>	<u>2</u>
1600	<u>07° 01'</u>	<u>79 31</u>	<u>330</u>	<u>8</u>	<u>320</u>	<u>2</u>
1700	<u>07° 05</u>	<u>79 37.5</u>	<u>265</u>	<u>11</u>	<u>350</u>	<u>2</u>
1800	<u>07° 11</u>	<u>79 49</u>	<u>080</u>	<u>10</u>	<u>350</u>	<u>2</u>
1900	<u>07 14</u>	<u>79 55</u>	<u>080</u>	<u>10</u>	<u>350</u>	<u>2</u>
2000	<u>07° 08'</u>	<u>80° 12.5'</u>	<u>240</u>	<u>15</u>	<u>345</u>	<u>2</u>
2100	<u>07° 07'</u>	<u>80° 19'</u>	<u>240</u>	<u>15</u>	<u>290 345</u>	<u>2</u>
2200	<u>7° 02.5'</u>	<u>80 32'</u>	<u>240</u>	<u>15</u>	<u>200 345</u>	<u>2</u>
2300	<u>6° 59'</u>	<u>80° 48'</u>	<u>240</u>	<u>18</u>	<u>280</u>	<u>2</u>
2400	<u>7° N</u>	<u>80° 57' W</u>	<u>220</u>	<u>15</u>	<u>—</u>	<u>—</u>

6° 58' N

8

16.5

10

32.5

7.3

39.8

16

55.8

5

60.8

1

61.8

2

63.8

7

70.8

3

73.8

Date 3 AUGShip ROCKAWAY (W377)Cruise No. Estrogas IIOrganization USCG

Recorder _____

Sunrise: Time 0617Position: Lat. 06 21, Long. 80 41Sunset: Time 1836Position: Lat. 5° 08', Long. 80° 20Miles travelled from 0000 hours to sunrise = 40Miles travelled from sunrise to sunset = 80Miles travelled from sunset to 2400 hours = 47

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	Electronic	6° 24.2' N	80° 39.3' W
2.	1200	Electronic	5° 41' N	80° 31.4' W
3.	2600	Celestial	4° 57' N	80° 16.8' W
4.	0400	Electronic	4° 43.0' N	80° 15.2' W
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	6° 55' N	80° 54.6' W	220	12	—	—
0200	7° 01' N	80° 54.1' W	220	10	—	—
0300	6° 58.1' N	80° 53.2' W	240	15	—	—
0400	6° 47.5' N	80° 52.0' W	190	12	—	—
0500	6° 39' N	80° 49' W	240	16	—	—
0600	6° 24' N	80° 43.5' W	180	12	—	—
0700	6° 24.2' N	80° 39.3' W	226	10	—	—
0800	6° 24.2' N	80° 39.3' W	200	8	125	2
0900	6° 02.2' N	80° 38' W	200	8	125	2
1000	5° 59' N	80° 35' W	195	10	125	2
1100	5° 40' N	80° 31' W	195	10	125	2
1200	5° 41.0' N	80° 31.4' W	220	15	210	2
1300	5° 38.9' N	80° 28.2' W	220	14	230	2
1400	5° 38.9' N	80° 28.2' W	250	15	260	2
1500	5° 40.18' N	80° 26.5' W	220	15	245	2
1600	5° 32' N	80° 25' W	215	17	230	3
1700	5° 20.5' N	80° 19' W	215	17	230	3
1800	5° 08' N	80° 20' W	207	19	220	3
1900	4° 56' N	80° 18' W	220	16	220	3
2000	4° 57' N	80° 16.8' W	225	9	225	2
2100	4° 56' N	80° 14' W	225	9	225	2
2200	4° 46' N	80° 16' W	225	9	225	2
2300	4° 51' N	80° 17' W	225	9	225	2
2400	4° 43.0' N	80° 15.2' W	225	10	—	—

Date 4 AUG. 1967 Ship ROCKAWAY (W377) Cruise No. _____
 Organization USCG Recorder _____

Sunrise: Time 0609 Position: Lat. 3°52', Long. 79°57'
 Sunset: Time 1830 Position: Lat. 2°17', Long. 79°31'

Miles travelled from 0000 hours to sunrise = 24

Miles travelled from sunrise to sunset = 105.5

Miles travelled from sunset to 2400 hours = 54.1

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0515	Omega	4°51'	79°53'
2.	0800	(1+2) CELESTIAL, ELECTRONIC	3°25.5'N	79°44.0'W
3.	1200	CELESTIAL, ELECTRONIC	3°09.0'N	79°41.2'W
4.	2000	ELECTRONIC	2°06.0'N	79°20.8'W
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	4°43'N	80°15.2'W	225	10	—	—
0200	4°40'N	80°04.0'W	225	15	—	—
0300	4°08'N	80°04'W	225	15	—	—
0400	4°04'	80°00'	218	14	—	—
0500	4°00'	79°55'	218	14	—	—
0600	3°52'	79°57'	218	15	190	2
0700	3°41'	79°49'	198	13	220	2
0800	3°25.5'	79°44'	225	10	220	2
0900	3°17'	79°48'	225	10	220	2
1000	3°12.5'	79°46'	225	10	220	2
1100	3°18'N	79°43'	225	10	220	2
1200	3°09'N	79°41.2'W	225	10	220	2
1300	3°N	79°40'W	225	10	220	2
1400	2°51'N	79°36.2'W	225	10	220	2
1500	2°30'N	79°34.5'W	225	10	220	2
1600	2°25'	79°33'	220	9	220	2
1700	2°18'	79°32'	220	11	220	2
1800	2°12.7'	79°31'	220	10	220	2
1900	2°06'	79°27.6'	220	14	220	2
2000	2°06'	79°20.8'	235	10	240	2
2100	1°53.5'	79°18'	270	7	270	2
2200	1°43'	79°24'	270	7	270	2
2300	1°41'	79°21.2'	270	7	275	2
2400	1°40'	79°23'W	255	8	—	—

21.1

31.1

43.1

51.1

54.1

Date 5 AUG 67 Ship ROCKAWAY (W-377) Cruise No.

Organization USCG Recorder

Sunrise: Time 0623 Position: Lat. 1° 24' N Long. 80° 31' W

Sunset: Time 1838 Position: Lat. 0° 31' N Long. 81° 57' W

Miles travelled from 0000 hours to sunrise = 71

Miles travelled from sunrise to sunset = 124

Miles travelled from sunset to 2400 hours = 23

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	1558	CELESTIAL	1° N	82° W
2.	2000	ELECTRONIC	0° 18.7' N	81° 57.5' W
3.	ØØØØ	ELECTRONIC	Ø° 22' N	81° 55.0' W
4.	Ø800	CELESTIAL	1° 06.5' N	81° 27.0' W
5.	0800	CELESTIAL	1° 18.0' N	80° 47.0' W

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	1° 37.5' N	79° 27.3' W	255	17	—	—
0200	1° 34' N	79° 40' W	255	15	—	—
0300	1° 31' N	79° 59.2' W	255	15	—	—
0400	1° 30' N	80 04 W	2	17	—	—
0500	1 26	80 11 W	210	16	—	—
0600	1 25	80 21 W	210	16	—	—
0700	1° 21'	80 38 W	200	17	—	—
0800	1° 18'	80° 47'	200	20	210	2
0900	1° 10.2'	80° 54.3	180	20	210	2
1000	1° 12' N	81° 07' W	210	10	210	2
1100	1° 13'	81° 12.5	210	10	230	1
1200	1° 06.5' N	81° 27.0' W	210	8	230	1
1300	1° 05' N	81° 40' W	210	10	230	1
1400	1° 02' N	81° 53' W	210	10	230	1
1500	1° N	82° W	210	8	230	1
1600	1 N	82 W	210	8	230	1
1700	Ø 47	81 58	210	9	230	1
1800	Ø 37	81 56	196	8.5	195	2
1900	Ø 26 N	81° 58' W	196	8.5	195	2
2000	0° 18.7' N	81° 57.5	195	4	195	1
2100	0° 21' N	81° 58'	195	2	195	1
2200	0° 21.2' N	81° 59'	200	2	210	1
2300	0° 19.5'	81° 56.5	200	2	210	1
2400	0° 22' N	81° 55.0' W	240	2	—	—


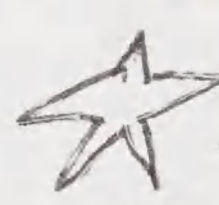

Date 6 AUG. 67Ship ROCKAWAY (W-377)

Cruise No. _____

Organization USCG

Recorder _____

Sunrise: Time 0630Position: Lat. 0° 36.5'Long. 81° 58' WSunset: Time 1835Position: Lat. 2° 4.58'Long. 82° 00' WMiles travelled from 0000 hours to sunrise = 36Miles travelled from sunrise to sunset = 88Miles travelled from sunset to 2400 hours = 30

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0608		0° 34' S	82° 00' W
2.	0800		0° 52.5' S	82° 00' W
3.	2000		2° 19.7' S	81° 58.5' W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	0° 16' N	81° 55.6' W	240	8	—	—
0200	0° 00' N	81° 57.1' W	215	8	—	—
0300	0° 11.3' S	81° 59.0' W	215	10	—	—
0400	0° 32' S	82° 00' W	220	12	—	—
0500	0° 32' S	82° 00' W	220	15	220	1
0600	0° 29.5' S	82° 00' W	180	17	180	2
0700	0° 42' S	81° 58' W	205	8	180	2
0800	0° 52.5' S	82° 00' W	200	8	200	1
0900	1° 03' S	82° 00' W	200	4	210	2
1000	1° 05' S	81° 59' W	200	4	200	2
1100	1° 06.2' S	82° 01.5' W	200	4	200	2
1200	1° 14.0' S	82° 01.0' W	200	10	200	1
1300	1° 38.8' S	81° 59' W	200	10	200	1
1400	1° 29.2' S	81° 59' W	200	10	200	1
1500	1° 20.5' S	81° 59.2' W	200	10	200	1
1600	1° 45' S	81° 59' W	200	6	200	2
1700	1° 48.5' S	81° 59' W	200	10	200	3
1800	2° 01' S	82° W	180	15	180	3
1900	2° 06.5' S	82° W	169	10	180	3
2000	2° 19.7' S	81° 58.5' W	165	20	180	2
2100	2° 24' S	81° 56.5' W	165	17	180	2
2200	2° 27' S	81° 55' W	165	10	180	2
2300	2° 29.3' S	81° 53.5' W	165	8	180	2
2400	2° 33' S	81° 50' W	185	10	—	—

Date 7 AUG 67 Ship ROCKAWAY (W37) Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0629 Position: Lat. _____, Long. _____

Sunset: Time _____ Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = 71

Miles travelled from sunrise to sunset = _____

Miles travelled from sunset to 2400 hours = _____

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	VISUAL	2°-43.2'S	80°28.0'W
2.	1200	VISUAL	2°-27.8'S	80°03.5'W
3.				
4.				
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	2° 38'S	81° 51'W	180	12	—	—
0200	2° 34.5S	81° 31'W	180	12	—	—
0300	2° 31'S	81° 21.8W	180	12	—	—
0400	2° 32'S	81 09.5W	145	11	—	—
0500	2 35.5S	80 55.5W	145	12	—	—
0600	2 43	80 42	145	12	—	—
0700	2 44	80 32	230	6	220	2
0800						
0900	PROCEEDING UP GUAYAS RIVER					
1000	TOWARDS GUAYAS RIVER, ECUADOR					
1100						
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						

2-53-2 (X) WITH
3-48-2 X WTD

Date 9 Aug Ship Roadrunner (377) Cruise No.

Organization USCG Recorder

Sunrise: Time 0632 Position: Lat. , Long.

Sunset: Time 1834 Position: Lat. 03° 16' W Long. 81° 38.5' W

Miles travelled from 0000 hours to sunrise =

Miles travelled from sunrise to sunset =

Miles travelled from sunset to 2400 hours = 20

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	1200 R	VIS & RAD	02-44.55	80-27 W
2.	2000	DR, ELECTRONIC	03° 05.0'S	81° 58.0' W
3.				
4.				
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100						
0200						
0300						
0400						
0500						
0600						
0700						
0800						
0900			PROCEEDING DOWN RIVER FROM			
1000			GUAYAQUIL			
1100						
1200	2° 44.5'S	80 27 W	240	12	245	1/2
1300	2° 46 S	80 35 W	225	11	245	1/2
1400	2° 50 S	80 48 W	225	14	245	1/2
1500	2 53 S	81 05 W	245	10	245	1/2
1600	2° 56.8 S	81° 17.1 W	245	10	245	1/2
1700	3° S	81° 31.1 W	245	10	245	1/2
1800	3° 2.7 S	81° 45.3 W	245	13	245	1/2
1900	3° 04.5 S	81° 57.2 W	245	12	245	1/2
2000	3° 07.5 S	82 01 W	135	8	-	-
2100	3° 07.5 S	82 59 W	135	8	-	-
2200	3° 10.5 S	82 59 W	135	8	-	-
2300	3 17 S	81 59 W	135	8	-	-
2400	3 19 S	81 59 W	135	7	-	-

6

Date 10 Aug 1967 Ship Rockaway (W377) Cruise No. 137

Organization USCG Recorder

Sunrise: Time 0634 Position: Lat. 3°52'S Long. 82°00'W

Sunset: Time 1831 Position: Lat. 5°36.5'S Long. 82°03.5'W

Miles travelled from 0000 hours to sunrise = 36 mi

Miles travelled from sunrise to sunset = 96 mi

Miles travelled from sunset to 2400 hours = 30 mi

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	ELECTRONIC	4°14.8'S	82°00.0'W
2.	1200	CELESTIAL	4°32.3'S	82°02.5'W
3.	2000	ELECTRONIC	5°52.0'S	82°00.0'W
4.				
5.				

Hourly Positions:

YK 3 06 - 82 00 W

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	3°30'S	82°00'W	205	6	135	1/2
0200	3°20'S	82°00'	205	12	135	1/2
0300	3°16.2'S	82°W	195	7	-	-
0400	3°28.2'S	82°W	190	7	-	-
0500	3°40'S	81°58'W	185	12	-	-
0600	3°52'S	82°W	195	12	150	1/2
0700	3 52	82	175	10	175	1/2
0800	4 14	82	175	10	175	1/2
0900	4 25	82	175	10	175	1/2
1000	4 34	82 02	130	4	130	1/2
1100	4 35	82 04	170	7	170	3
1200	4 40	82 02	135	13	140	1
1300	4 42.3	82 02.5	140	10.5	140	1/2
1400	4 49	82 02	150	10	140	1/2
1500	4 58	82 02	150	10	140	1/2
1600	5°22'S	82°00'W	175	10	170	1/2
1700	5°22'S	82°00'W	160	13	160	1/2
1800	5°30'S	82°04'W	155	13	160	1/2
1900	5°43'S	82°03'W	170	5	160	1/2
2000	5°52'S	82°00'W	125	12	130	1/2
2100	06 00	82 00	134	19	130	1/2
2200	06 00	82 01'W	160	15	150	1/2
2300	06 01.5	82 02'W	160	15	150	1/2
2400			135	20	130	1/2

Date 11 AUGShip ROCKAWAY (W-377)Cruise No. Eastropac IIOrganization USCG

Recorder _____

Sunrise: Time 0637
1827 Position: Lat. 7°S, Long. 82°WSunset: Time 1827 Position: Lat. 8°30'S, Long. 82°WMiles travelled from 0000 hours to sunrise = 47.7Miles travelled from sunrise to sunset = 119Miles travelled from sunset to 2400 hours = 7

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	DR, ELECTRONIC	07° 14.5'S	82° 01.0'W
2.	1200	CELESTIAL	07° 34.0'S	81° 59.0'W
3.	2000	DR, ELECTRONIC	08° 50.8'S	82° 01.0'W
4.				
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	06-22S	082-00W	130	20	130	1
0200			125	18	130	1
0300			125	20	130	1/2
0400	06-47S	081-58W	135	10	130	1/2
0500	06-47S	081-58W	140	11	130	1/2
0600			150	13	130	1/2
0700	07-07S	081-58W	140	10	130	1/2
0800			127	11	130	1
0900	07-28S	081-57W	135	8	130	1
1000	07-28S	081-57W	135	8	130	2
1100	07-28S	081-57W	140	4	130	2
1200	07-28S	081-57W	140	3	130	2
1300	07-43S	82-01	140	5	140	2
1400	07-53S	82-02	160	15	140	2
1500	08-08S	82-00	155	15	140	2
1600	8°49'S	82°00'W	170	10	170	2
1700	8°16'S	82°W	170	12	170	3
1800	8°30.5S	82°W	170	12	170	3
1900	8°46'S	82°W	160	15	160	3
2000	8 50.8	82 01.0	139	15	140	2
2100	8 50.8	82-01.0	139	15	140	2
2200	8 50.8	82 01.0	139	15	140	2
2300	8 50.8	82 01.0	139	15	140	2
2400	8 50.8	82 01 W	070	12	140	2

Date 12 AUG 1967 Ship ROCKAWAY (W377) Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0640 Position: Lat. 9°49'S, Long. 82°W

Sunset: Time 1823 Position: Lat. 9°52'S, Long. 81°59'W

Miles travelled from 0000 hours to sunrise = 48.5

Miles travelled from sunrise to sunset = 84

Miles travelled from sunset to 2400 hours = 6

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	DR, ELECTRONIC	10°01.5'S	81°59.0'W
2.	1200	CELESTIAL, ELECTRONIC	10°09.0'S	81°53.0'W
3.	2000	CELESTIAL	09°50.5'S	80°53.0'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	0859S	8200W	115	17	100	2
0200	0908S	8200W	130	20	100	2
0300	0925S	8200W	130	18	100	2
0400	0933S	8200W	150	15	150	2
0500	0933S	8200W	110	13	110	2
0600	0939S	8200W	135	13	130	2
0700	0951S	8200W	145	13	130	3
0800	1001.5S	8159.2W	135	17	140	2
0900	1014S	82	135	18	140	2
1000	1014S	82	135	20	140	3
1100	1014S	82	135	20	140	3
1200	1009S	81-53W	120	20	140	3
1300	1008S	81-47W	120	20	140	3
1400	1001.5S	81-28W	130	19	140	3
1500	1002S	81-22W	095	17	140	3
1600	1002.5S	81022W	135	15	130	3
1700	10°S	81°20'W	105	17	130	3
1800	9°59.5S	81°06'W	105	20	130	4
1900	9°51'S	80°53'W	105	20	130	4
2000	9°51'S	80°53'W	105	20	130	4
2100	9°51'S	80°53'W	105	20	130	4
2200	9°51'S	80°53'W	015	20	130	4
2300	9°51'S	80°53'W	015	20	130	4
2400	9°50'S	80°53'W	140	18.5	130	3

Date 13 AUGUST 1967 Ship ROCKAWAY (W377)Cruise No. Eastpac IIOrganization USCG

Recorder _____

Sunrise: Time 0631 Position: Lat. 9°30'S, Long. 80°WSunset: Time 1813 Position: Lat. 10°31'S, Long. 78°53'WMiles travelled from 0000 hours to sunrise = 50Miles travelled from sunrise to sunset = 92Miles travelled from sunset to 2400 hours = 42

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	ELEL	09°26.0'S	79°56.8'W
2.	1200	CELESTIAL & ELECTRONIC	09°31.7'S	79°34.0'W
3.	2000	CELESTIAL & ELECTRONIC	10°41.8'S	78°48.3'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
------	----------	-----------	-----------	----------	-----------	-----------

0100	9°49'S	80°-43'W	130	20	130	3
0200	9°44'S	80°-30'W	115	20	130	3
0300	9°42'S	80°-24'W	125	18.5	135	4
0400	9°37'S	80°13'W	135	10	135	4
0500	9°37'S	80°13'W	135	15	135	4
0600	9°36'S	80°07'W	105	10	135	4
0700	9°32'S	80°04'W	100	10	130	4
0800	9 28.5S	79 45 W	120	7.5	130	3
0900	9 24.5	79 33	120	7.5	130	4
1000	9 24.5	79 33	140	14	130	4
1100	9 22	79 39	130	15	130	2
1200	9-31.7S	79-34	140	17	130	4
1300	9-41.5	79-24	140	17	130	3
1400	9-56.5	79-20	140	18.5	130	2
1500	9-59.5	79-13	140	18.5	155	2
1600	10°09'S	79°08'W	140	20	160	4
1700	10°20.5'S	79°W	140	20	160	4
1800	10°28.5S	78°56'W	135	20	160	4
1900	10°38.5S	78°49'W	135	22	160	5
2000	10 41.8	78 48.3	135	23	160	5
2100	10 51.5	78 41	140	25	160	5
2200	10 57.5	78 36	140	20	160	5
2300	11 08.5	78 24	120	23	160	5
2400	11 13.5	78 25W	124	22	160	4

$$\begin{array}{r} 1 \\ 1749 \\ 49 \\ \hline 1838 \end{array}$$

Date 14 Aug 1967 Ship RORAWAY (20377) Cruise No.
Organization LISC G Recorder

Sunrise: Time 0624 Position: Lat. 11°54'S, Long. 77°45'W

Sunset: Time 1808 Position: Lat. , Long.

Miles travelled from 0000 hours to sunrise = 78.9

Miles travelled from sunrise to sunset =

Miles travelled from sunset to 2400 hours =

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	ELEC., VISUAL	12° 01.5'S	77° 15.3'W
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	11-22.5	78-17 W	125	22	160	5
0200	11-29.5	78-12 W	134	23	160	4
0300	11-40.5	78-03 W	140	20	160	4
0400	11° 36.5'S	78° 09'W	130	20	160	4
0500	11° 48' S	77° 58'W	135	20	160	4
0600	11° 53'S	77° 35'W	130	18	160	4
0700	11° 56'S	77° 31.8'W	130	14	160	4
0800						
0900			↓			
1000			CALLAO, PERU			
1100						
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						

Date 16 Aug 1967 Ship Rockaway () Cruise No.
Organization Recorder

Sunrise: Time 0628 Position: Lat Callao, Long.

Sunset: Time 1807 Position: Lat. 12°21'S, Long. 77°49'W

Miles travelled from 0000 hours to sunrise = Callao

Miles travelled from sunrise to sunset = 50.0

Miles travelled from sunset to 2400 hours = ~~51~~ 31.0

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	<u>2000</u>	<u>CELESTIAL</u>	<u>12°31.0'S</u>	<u>78°19.3'W</u>
2.				
3.				
4.				
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100						
0200						
0300						
0400						
0500						
0600						
0700						
0800						
0900			CALLAO, PERU			
1000						
1100						
1200						
1300						
1400			160	17	208	1/2
1500			160	15	160	2
1600	12°16.5'S	77°31.5'W	150	9	180	1/2
1700	12°15.0'S	77°40'W	150	10	180	1/2
1800	12°21'S	77°49'W	150	10	180	1/2
1900	12°26'S	78°04.5'W	135-14	135-14	185	1/2
2000	12°31.0'S	78°19.3'W	160	10	160	1/2
2100	12°30.8'S	78°03.1'W	160	14	160	1/2
2200	12°30.8'S	78°03.1'W	155	14	160	1/2
2300	12°30.8'S	78°03.1'W	165	14	160	1/2
2400	12°30.8'S	78°03.1'W	160	12	160	1/2

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Date 17 AUG 67 Ship CGC ROCKAWAY WAGO 377 Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0628 Position: Lat. 12°50'S Long. 79°08'

Sunset: Time 1816 Position: Lat. 13°21'S Long. 80°29'W

Miles travelled from 0000 hours to sunrise = 37.8

Miles travelled from sunrise to sunset = 96.5

Miles travelled from sunset to 2400 hours = 50.4

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800		12°50'S	79°14.2'W
2.	1200		12°58.5'S	79°31.8'W
3.	2000		13°27.2'S	80°48.5'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	12 26	78 14	160	10	160	2
0200	12 26	78 14	125	12	130	4
0300	12 33S	78 26W	175	12	130	4
0400	12° 40'S 39	78° 37'W	150	16	130	3
0500	12° 44.5'S	78° 52'W	150	16	160	3
0600	12° 47'S	78° 53'W	150	10	165	3
0700	12° 52'S	79° 02'W	150	10	185	3
0800	12° 50.4'S	79° 14.2'W	710	10	200	2
0900	13° S	79° 31.3'W	160	3	200	2
1000	12° 56'S	79° 31.3W	350	3	180	2
1100	12° 56'S	79° 31.3W	350	3	190	2
1200	12 58.5S	79 31.8W	180	10	150	2
1300	13 03	79 43	180	10	180	2
1400	13° 08'S	79 57.5	177	12	180	4
1500	13 12.1S	80 12'W	175	8	190	4
1600	13 13.0 10S	80 10 W	175	8	190	4
1700	13° 11'S	80° 13'W	175	8	190	4
1800	13° 19'S	80° 25'W	175	8	195	3
1900	13° 24.5'S	80° 37.8W	140	18	175	3
2000	13° 27.2'S	80° 48.5'W	175	10	155	1 1/2
2100	13° 30'S	80° 51'W	145	10	155	1 1/2
2200	13° 30'S	80° 51' W	145	15	155	1 1/2
2300	13° 30'S	80° 53' W	145	15	155	1 1/2
2400	13° 31'S	80 56'W	131	15	155	1 1/2

Date 18 Aug 67 Ship CGC ROCKAWAY WAGO-377 Cruise No. _____
 Organization USCG Recorder _____

Sunrise: Time 0641 Position: Lat. 13°52'S Long. 81°52'W
 Sunset: Time 1825 Position: Lat. 14°29'S Long. 83°35'W

Miles travelled from 0000 hours to sunrise = 54.7

Miles travelled from sunrise to sunset = 98.2

Miles travelled from sunset to 2400 hours = 20

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800		13°57.5'S	82°25.7'W
2.	1200		14°04'S	82°43.0'W
3.	2000		14°29.0'S	83°40.7'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	13°35.5'S	81°08'W	131	9.8	130	1/2
0200	13°41'S	81°22'W	138	11	130	1/2
0300	13°45'S	81°31.5'W	145	15	130	1/2
0400	13°44.8'S	81°32.2'W	125	10	130	1/2
0500	13°46.5'S	81°38'W	095	11	135	1/2
0600	13°50'S	81°46.5'W	095	11	135	1/2
0700	13°53.5'S	81°56.5'W	095	11	135	1/2
0800	13°57.5'S	82°25.7'W	160	10	155	1
0900	13°58'S	82°25'W	160	10	155	1
1000	13°58'S	82°25'W	160	10	155	1
1100	14°0'S	82°28'W	160	10	155	1
1200	14°04'S	82°43'W	135	11	140	2
1300	14°10'S	82°46.5'W	135	12	130	1
1400	14°15'S	82°57'W	140	15	140	2
1500	14°19'S	83°2.5'W	130	15	130	2
1600	14°18'S	83°02'W	130	15	130	1
1700	14°22.8'S	83°18.5'W	140	15	130	1
1800	14°26.5'S	83°29'W	140	15	130	1/2
1900	14°31.2'S	83°40.8'W	135	15	130	1/2
2000	14°29.0'S	83°40.7'W	120	15	135	1
2100	14°27.0'S	83°40.7'W	110	16	135	1
2200	14°27.0'S	83°40.7'W	120	18	135	1
2300	14°27.0'S	83°40.7'W	135	20	135	1
2400	14°27.0'S	83°40.7'W	135	15	135	1

Date 19 Aug 67 Ship CGC ROCKAWAY WAGO-377 Cruise No. _____
 Organization USCG Recorder _____

Sunrise: Time 0553 Position: Lat. 14° 41.55 Long. 84° 50' W

Sunset: Time 1734 Position: Lat. 13° 49.38 Long. 85° 01' W

Miles travelled from 0000 hours to sunrise = 53

Miles travelled from sunrise to sunset = 95

Miles travelled from sunset to 2400 hours = 42

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELESTIAL	14° 58.5'S	85° 00.0' W
2.	1200	CELESTIAL	14° 42.7'S	85° 00.5' W
3.	2000	CELESTIAL	13° 35.0'S	85° 00.0' W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	14 33.5	83 52	130	14	130	1
0200	14 38.8	84 03	130	14	130	1
0300	14 44.5	84 15	130	17	130	2
0400	14 41.5	84° 21' W	130	15	130	1/2
0500	14° 47.5	84° 24' W	130	15	130	1/2
0600	14° 45.5	84° 25.5' W	130	15	130	1/2
0700	14° 54.55	84° 50.8' W	115	15	135	1/2
0800	14° 58.5'S	85° W	130	10	135	1
0900	14° 58.5'S	85° W	130	10	135	1
1000	14° 58.5'S	85° W	120	12	130	1
1100	14 54	85 W	110	12	130	1
1200	14 45	85 W	090	8	140	3
1300	14 30.5	85 W	090	8	140	3
1400	14 18	85 W	090	8	140	3
1500	14 18	85 W	104	8	140	3
1600	14° 10'	85 00 W	134	14	150	3
1700	13° 58.55	85 00 W	115	8	150	3
1800	13° 41.85	85 06 W	115	8	150	3
1900	13° 35.5	85° 02.7 W	120	15	150	3
2000	13° 35.0'S	85 W	130	15	150	2
2100	13° 35.5	85 W	130	17	150	2
2200	13° 30.5	85 W	120	15	150	1
2300	13° 20.5'S	85 W	110	10	150	1
2400	13° 10.0'S	85 W	105	15	150	2

152
94
18
5

Date 20 Aug 1967 Ship CGC ROCKAWAY (WAGO-3)77 Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0553 Position: Lat. 12° 42' S, Long. 85° 04' W

Sunset: Time 1734 Position: Lat. 11° 09' S, Long. 85° 0' W

Miles travelled from 0000 hours to sunrise = 40

Miles travelled from sunrise to sunset = 90

Miles travelled from sunset to 2400 hours = 53

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800		14° 58.5' S	85° 00' W
2.	1200		14° 42.7' S	85° W
3.	2000		13° 35' S	85° W
4.				
5.				

Wrong Aug 19

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	12 53	85	103	12	100	1
0200	12 53	85	120	15	130	1
0300	12 53	85	140	15	130	1
0400	12 53	85	160	15	135	1
0500	12 53	85	160	15	135	1
0600	12 53	85° 04' W	160	15	135	1
0700	12° 28.5	85° 05.5	160	15	135	1
0800	12° 17.2' S	85° 01.0' W	110	10	145	2
0900	12° 13' S	85° W	125	10	145	1
1000	12° 13' S	85° W	120	10	150	1
1100	12° 13' S	85° W	120	10	150	1
1200	12 00.35	85° W	090	12	150	3
1300	11 51.5	85° W	090	12	150	3
1400	11 37.55	85° W	090	12	150	3
1500	11 29	85° W	090	12	150	3
1600	11 29	85° W	130	15	150	3
1700	11° 15.8	85° W	130	9	150	3
1800	11° 03.2	85° W	135	16	150	3
1900	10° 52.5	85° W	150	12	150	3
2000	10° 46.5	85° W	135	15	130	1
2100	10° 46.5	85° W	130	15	130	1
2200	10° 46.5	85° W	130	18	130	1
2300	10° 46.5	85° W	130	18	130	1
2400	10 44	85	130	15	130	2

Date 21 Aug 67 Ship Rockaway (WAGO-377) Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0549 Position: Lat. 10°00'S, Long. 85°00'W

Sunset: Time 1740 Position: Lat. 8°20'S, Long. 85°02'W

Miles travelled from 0000 hours to sunrise = 40.3

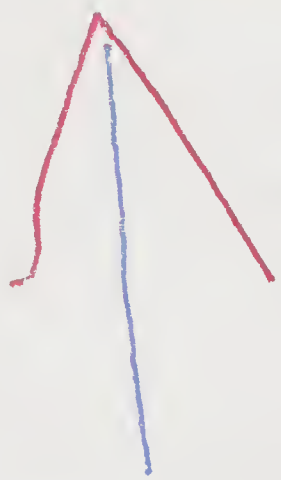
Miles travelled from sunrise to sunset = 97.0

Miles travelled from sunset to 2400 hours = 42

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800		9°31.8'S	85°03.6'W
2.	1200		9°03.0'S	85°07.8'W
3.	2000		7°59.0'S	85°02.0'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	10 39.5S	85 00W	135	15	130	2
0200	10 27	85 00W	130	15	130	2
0300	10 15	85 00W	130	15	130	2
0400	10 05'S	85 00'W	125	14	130	2
0500	10 05'S	84 58.3'W	122	12	130	2
0600	9 55'S	85 00'W	125	10	135	2
0700	9 42.5S	85 00'W	125	10	135	2
0800	9 31.8'S	85 03.6'W	120	10	135	2
0900	9 23'S	85 W	120	10	135	2
1000	9 23'S	85 W	120	10	135	2
1100	9 21'S	85 W	120	10	135	2
1200	9 03'	85 07.8	135	15	135	2
1300	8 51	85 03	135	15	135	2
1400	8 37.3S	85 01.8'W	"	"	"	"
1500	8 35'S	85 00.6W	"	"	"	"
1600	8 32'S	85 01.5W	135	15	135	2
1700	8 24.5S	85 01.5W	135	16	135	3
1800	8 16'S	85 02'W	135	16	135	3
1900	8 07'S	85 02'W	135	16	135	3
2000	7 59'S	85 02'W	135	20 15	135	2
2100	7 59'S	85 02'W	135	18	135	2
2200	7 59'S	85 02'W	140	18	135	2
2300	7 53'S	85 W	130	15	140	1
2400	7 42	85 W	125	16	130	1



Date 22 AUG 67 Ship ROCKAWAY () Cruise No.
 Organization USCG Recorder

Sunrise: Time 0547 Position: Lat. 6°58'S, Long. 85°W
 Sunset: Time 1743 Position: Lat. 5°25'S, Long. 85°W

Miles travelled from 0000 hours to sunrise = 38.6
 Miles travelled from sunrise to sunset = 86.2
 Miles travelled from sunset to 2400 hours = 25.4

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	<u>0800</u>		<u>6°40'S</u>	<u>85°07'W</u>
2.	<u>1200</u>		<u>6°17.3'S</u>	<u>85°05'W</u>
3.	<u>2000</u>		<u>5°11.3'S</u>	<u>84°58.5'W</u>
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	<u>7°30'</u>	<u>85°W</u>	<u>110</u>	<u>10</u>	<u>150</u>	<u>2</u>
0200	<u>7 19</u>	<u>85</u>	<u>100</u>	<u>10</u>	<u>150</u>	<u>2</u>
0300	<u>7 17</u>	<u>85</u>	<u>135</u>	<u>10</u>	<u>150</u>	<u>2</u>
0400	<u>7°12'S</u>	<u>85°W</u>	<u>135</u>	<u>10</u>	<u>150</u>	<u>2</u>
0500	<u>7°03'S</u>	<u>85°W</u>	<u>135</u>	<u>13</u>	<u>150</u>	<u>2</u>
0600	<u>7°54'S</u>	<u>85°W</u>	<u>150</u>	<u>11</u>	<u>145</u>	<u>2</u>
0700	<u>6°46'</u>	<u>85°W</u>	<u>150</u>	<u>11</u>	<u>145</u>	<u>2</u>
0800	<u>6°40'S</u>	<u>85°07'W</u>	<u>140</u>	<u>10</u>	<u>150</u>	<u>2</u>
0900	<u>6°35'S</u>	<u>85°W</u>	<u>140</u>	<u>11</u>	<u>150</u>	<u>2</u>
1000	<u>6°33'S</u>	<u>85°09'W</u>	<u>140</u>	<u>10</u>	<u>150</u>	<u>2</u>
1100	<u>6°28'S</u>	<u>85°08'W</u>	<u>140</u>	<u>10</u>	<u>145</u>	<u>2</u>
1200	<u>6°17.3'S</u>	<u>85°05'W</u>	<u>130</u>	<u>6.5</u>	<u>150</u>	<u>2</u>
1300	<u>6°05'S</u>	<u>85°02'W</u>	<u>130</u>	<u>7</u>	<u>150</u>	<u>3</u>
1400	<u>5°52'</u>	<u>85°02'</u>	<u>140</u>	<u>11</u>	<u>150</u>	<u>3</u>
1500	<u>5°52'</u>	<u>85°02'</u>	<u>140</u>	<u>10</u>	<u>150</u>	<u>3</u>
542'S 1600	<u>5°35'S</u>	<u>85°00'W</u>	<u>130</u>	<u>10</u>	<u>155</u>	<u>2</u>
1700	<u>5°32'S</u>	<u>85°00'W</u>	<u>130</u>	<u>12</u>	<u>155</u>	<u>2</u>
1800	<u>5°19'S</u>	<u>85°00'W</u>	<u>180</u>	<u>11</u>	<u>140</u>	<u>2</u>
1900	<u>5°14'S</u>	<u>85°00'W</u>	<u>180</u>	<u>11</u>	<u>140</u>	<u>2</u>
2000	<u>5°11.3'S</u>	<u>84°58.5'W</u>	<u>160</u>	<u>10</u>	<u>—</u>	<u>—</u>
2100	<u>5°11.3'S</u>	<u>84°58.5'W</u>	<u>165</u>	<u>10</u>	<u>—</u>	<u>—</u>
2200	<u>5°11.3'S</u>	<u>84°58.5'W</u>	<u>160</u>	<u>10</u>	<u>—</u>	<u>—</u>
2300	<u>5°11.3'S</u>	<u>84°58.5'W</u>	<u>160</u>	<u>10</u>	<u>—</u>	<u>—</u>
2400	<u>50 05</u>	<u>85°00'W</u>	<u>140</u>	<u>8</u>	<u>160</u>	<u>3</u>

Date 23 Aug 1967 Ship ROCKAWAY () Cruise No.

Organization USCG Recorder

Sunrise: Time 0542 Position: Lat. 4°14'S, Long. 85°W

Sunset: Time 1744 Position: Lat. 2°53'S Long. 85°W

Miles travelled from 0000 hours to sunrise = 49.3

Miles travelled from sunrise to sunset = 81.0

Miles travelled from sunset to 2400 hours = 52.1

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800		3°51.8'S	85°05.0'W
2.	1200		3°42.5'S	85°08.5'W
3.	2000		2°27.5'S	84°58.5'W
4.				
5.				

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85

Hourly Positions:

12.4

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	04 53.5S	85 00 W	140	10	160	2
0200	04 45	85 00	130	9	170	2
0300	04 33.5	85 00	130	10	170	2
0400	4° 26'S	85°	130	10	155	3
0500	4° 22'S	85°	125	10	155	3
0600	4° 11'S	85°	102	9	160	2
0700	4° 04.5S	85°	150	9	145	1
0800	3° 51'S	85° 05'	160	10	180	1
0900	3° 38'S	85° 05'	160	10	180	1
1000	3° 28'S	85° 05'	170	10	180	2
1100	3° 40.5'S	85° 05'	170	10	180	2
1200	3° 42.5S	85 00.5'W	160	7	170	2 swells
1300	3 30.5	85 00 W	155	7	170	2 "
1400	3 18 S	85 00 W	140	4	170	2 "
1500	3 08.5S	85 00 W	140	4	170	2 "
1600	3° 01.5'S	85° 00'W	160	2	170	2
1700	3° 01'S	85° 00'W	160	8	170	2
1800	2° 49'S	85° 00'W	125	11	175	2
1900	2° 39'S	85° 00'W	185	10	175	2
2000	2° 27.5'S	84° 58.5'W	180	10	180	1
2100	2° 16'S	85° W	175	10	175	1
2200	2° 16'S	85° W	160	12	175	1
2300	2° 16'S	85° W	160	11	175	2
2400	2 10	85	160	7	170	2

3°51'

Date 24 Aug 67 Ship ROCKAWAY () Cruise No.
Organization USCG Recorder

Sunrise: Time 0540 Position: Lat. 1° 22'S, Long. 85° W
Sunset: Time 1746 Position: Lat. 0° 18'N, Long. 85° W

Miles travelled from 0000 hours to sunrise = 40

Miles travelled from sunrise to sunset = 98.6

Miles travelled from sunset to 2400 hours = 24

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	⊙ + DR	0° 56.5'S	85° 01.5' W
2.	1200	⊙ + LAN	0° 31.8'S	85° 03.7'
3.	2000	<u>Λ</u>	0° 44.5'N	84° 55.5' W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	2° 01'S	85° 00'W	165	9	170	2
0200	1 45.5	85 00 W	165	7	170	2
0300	1 35	85	165	9	170	2
0400	1° 31'S	85 00 W	170	2 10	170	2
0500	1° 30'S	85 00 W	170 175	10	180	2
0600	1° 19'S	85° 00'W	170 175	10	180	2
0700	1° 07'S	85° 00'W	180	15	180	2
0800	0° 52'S	85° W	180	10	180	2
0900	0° 46'S	85.05°W	180	10	180	2
1000	0° 40'S	85.05°W	180	10	180	2
1100	0° 33'S	85.03W	180	8	180	2
1200	0° 31.8S	85° 03.7	210	14	210	1
1300	0° 20	85 00	180	14	210	2
1400	0 12.5	85 00	180	14	210	2
1500	0	85	180	14	200	2
1600	0	85°	180	14	200	2
1700	0° 09'N	85° W	180	14	200	2
1800	0° 19'N	85° W	180	15	200	2
1900	0 28.5N	85° W	180	15	200	2
2000	0° 44.5'N	84° 55.5W	180	14	190	2
2100	0° 44.5'N	84° 55.5W	180	15	190	2
2200	0° 44.5'N	84° 55.5W	180	10	190	2
2300	0° 44.5'N	84° 55.5W	180	16	190	2
2400	0° 47'N	84 55 W	197	15	190	2

$$\frac{5}{6}$$

$$\frac{10}{6} \times 8.7$$

$$1.4$$

$$\frac{10.4}{11.8}$$

$$12.5$$

$$\frac{62.5}{6}$$

$$10.4$$

$$\frac{60}{20}$$

$$25$$

$$2$$

$$1$$

$$26$$

$$8.7$$

$$8.7$$

$$2.1$$

$$\frac{128}{6} - 2.1$$

$$\begin{array}{r} 6.7 \\ 2.1 \\ \hline 4.6 \\ 12.9 \end{array} \quad \begin{array}{r} .2 \\ .6 \\ 7.3 \end{array}$$

$$\begin{array}{r} 60 \\ 25 \\ \hline 32 \end{array} \times 12.5$$

$$6.5$$

Date 25 AUG 67 Ship Rochaway (WAGO-377) Cruise No. _____
 Organization USCG Recorder _____

Sunrise: Time 0538 Position: Lat. 1°24'N, Long. 85°02.5'W

Sunset: Time 1748 Position: Lat. 2°55'N, Long. 85°00.0'W

Miles travelled from 0000 hours to sunrise = 38.9

Miles travelled from sunrise to sunset = 82.1

Miles travelled from sunset to 2400 hours = 36

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELESTIAL	1°57.0'N	84°56.3'W
2.	1200	CELESTIAL	2°16.8'N	84°56.8'W
3.	2000	CELESTIAL	3°15.0'N	84°58.8'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	0°51'N	84°55.5'	213	14.5	210	2
0200	0°57'N	85°00'	210	15	210	2
0300	0°04'N	85°00'	210	15	210	2
0400	1°15'N	85°00'W	200	15	220	2
0500	1°23'N	85°02'W	200	15	210	2
0600	1°24.8'N	85°04'W	200	15	210	2
0700	1°35'N	85°00'W	195	15	210	2
0800	1°57.0'N	84°56.3'W	220	17	200	2
0900	2°01.1'N	84°56'W	210	15	210	2
1000	2°01.1'N	84°56'W	200	16	200	2
1100	2°02.5'N	84°57'W	200	16	200	1
1200	2°16.8'N	85°00'W	220	16	220	2
1300	2°28.5'N	84°57'W	220	16	220	2
1400	2°34'N	84°58'W	220	15	220	2
1500	2°43.5'N	84°59.5'	220	15	220	2
1600	2°47'N	85°00'W	200	15	220	2
1700	2°49'N	85°00'W	200	15	195	2
1800	2°57'N	85°00'W	200	15	195	2
1900	3°02'N	85°00'W	180	16	210	2
2000	3°15'N	84°58.8'W	185	16	180	2
2100	3°27.5'N	85°W	185	15	180	2
2200	3°27.5'N	85°W	210	16	180	2
2300	3°27.5'N	85°W	210	13	180	2
2400	3°32'N	85°W	210	14	210	2

10
40

545
408

Date 26 Aug 67 Ship ROCKAWAY () Cruise No.
 Organization USCG Recorder

Sunrise: Time 0535 Position: Lat. 4 15' N, Long. 85 00 W

Sunset: Time 1750 Position: Lat. 6° 03' N, Long. 85 00 W

Miles travelled from 0000 hours to sunrise = 33

Miles travelled from sunrise to sunset = 88

Miles travelled from sunset to 2400 hours = ~~38~~ 38

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	1200	C LAT	5° 15' N	84° 46' W
2.	2000	ELECTRONIC OR CELESTIAL	6° 19.7' N	84 55.5 W
3.	0800	ELECTRONIC	4° 41.0'	84.530 W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	3° 46' N	84 57.5 W	215	15	220	2
0200	3 50 N	85 W	220	15	220	2
0300	2 02 N	85 W	220	15	220	2
0400	4 07 N	85 W	210	17	220	2
0500	4 07 N	85 W	210	16	220	2
0600	4 18 N	85 W	210	17	220	3
0700	4 28 N	85 W	210	17	220	3
0800	4° 12' N	85 W	2195	15	230	2
0900	4° 43' N	85 W	210	10	230	2
1000	4° 48' N	85° W	210	15	230	2
1100	5° 00' N	85° W	210	15	230	2
1200	5 15 N	84 46 W	210	15	220	3
1300	5° 25.5 N	84 52	285	17	220	4
1400	5 36.5 N	84 57	243	17	225	3
1500	5 41.5 N	85 W	255	15	220	3
1600	5 42 N	85 W	260	20	275	3
1700	5 54 N	85 W	260	20	270	3
1800	6 03 N	85 W	250	15	270	3
1900	6 24 N	85 W	245	17	270	3
2000	6 19.7 N	84° 55.5 W	240	8	—	—
2100	6° 19.7' N	84° 55.5 W	220	10	—	—
2200	6° 19.7' N	84° 55.5 W	220	6	—	—
2300	6° 24 N	84° 56 W	210	6	—	—
2400	6 32	84 56	290	16	—	—

27
11
2.6

12
1.8
2.1
3.9

Date 27 Aug 67 Ship ROCKAWAY () Cruise No.
Organization USCG Recorder

Sunrise: Time 0531 Position: Lat. 07°09'N, Long. 84°44'W

Sunset: Time 1750 Position: Lat. 08°30'N, Long. 85°03'W

Miles travelled from 0000 hours to sunrise = 78 mi

Miles travelled from sunrise to sunset = 63 mi

Miles travelled from sunset to 2400 hours = ~~78~~ 41 mi

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800 S	☉ + DR	07°28'N	85°00.5'W
2.	1200 S	LAN ± ☉	07°52.0'N	85°04'W
3.	2000 S	CELESTIAL	08°53.0'N	85°00.5'W
4.				
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	6 42 N	84 57 W	250	8	250	3
0200	6 51 N	84 57 W	265	8	250	3
0300	6 58 N	84 57 W	250	8	250	3
0400	" "	" "	250	7	250	2
0500	7 04 N	85 00 W	250	7	250	2
0600	7 10 N	84 44 W	250	8	250	2
0700	7 19 N	84 50 W	250	8	250	2
0800	7 28 N	84 50 W	210	6	240	1
0900	7 35.5 N	84 50 W	250	6	240	1
1000	7 35.5 N	84 50 W	260	5	220	1
1100	7 36 N	85 0 W	260	9	230	1
1200	7 52	85 04	250	5	230	2
1300	8 02 N	85 04 W	280	5	230	2
1400	8 07	85 2.5 W	280	7	230	2
1500	8 14.6 N	85 01.0 W	290	6	230	2
1600	8 20 N	85 00 W	140	5	230	1
1700	8 27 N	85 00 W	140	3	230	1
1800	8 30 N	85 04 W	140	8	230	1
1900	8 47 N	85 08 W	270	5	230	1
2000	8 53.9 N	85 00.5 W	300	4	—	—
2100	8 53.9 N	85 00.5 W	240	3	—	—
2200	8 53.9 N	85 00.5 W	195	6	—	—
2300	8 58.1 N	84 58.5 W	210	6	—	—
2400	9 08	84 57	250	3	—	—

85°00.5'W
85°W
85°W

Date 28 Aug. 67 Ship ROCKAWAY () Cruise No.
Organization USCG Recorder

Sunrise: Time 0532 Position: Lat. , Long.

Sunset: Time 1748 Position: Lat. MOORED - PUNTA ARENAS, COSTA RICA

Miles travelled from 0000 hours to sunrise = 57

Miles travelled from sunrise to sunset = 19

Miles travelled from sunset to 2400 hours =

TIME OF FIX TYPE OF FIX LATITUDE LONGITUDE

1. 0800 S USCGC, RADAR 09° 47.0' N 84° 47.9' W

2.

3.

4.

5.

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	<u>9 14 N</u>	<u>84 54.5 W</u>	<u>335</u>	<u>3</u>	<u>—</u>	<u>—</u>
0200	<u>9 26.5 N</u>	<u>84 50.5</u>	<u>350</u>	<u>4</u>	<u>—</u>	<u>—</u>
0300	<u>9 26.5 N</u>	<u>84 50.5</u>	<u>340</u>	<u>4</u>	<u>—</u>	<u>—</u>
0400			<u>355</u>	<u>7</u>	<u>—</u>	<u>—</u>
0500			<u>350</u>	<u>4</u>	<u>010</u>	<u>1/2</u>
0600			<u>285</u>	<u>10</u>	<u>010</u>	<u>1/2</u>
0700			<u>335</u>	<u>7</u>	<u>010</u>	<u>1/2</u>
0800						
0900						
1000						
1100		<u>PUNTA ARENAS, COSTA RICA</u>				
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						

Date AUGUST 30 JULY 67 Ship ROCKAWAY (W-377) Cruise No. EASTROPAC II
 Organization USCG Recorder Qmow's

Sunrise: Time 0535 Position: Lat. PONTA ARENAS
 Sunset: Time 1747 Position: Lat. 10° 03' N Long. 85° 58' W

Miles travelled from 0000 hours to sunrise = - 1/2
 Miles travelled from sunrise to sunset = N/A
 Miles travelled from sunset to 2400 hours = 78.2

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	1200	ELECTRONIC VISUAL	9° 47.4' N	84° 49.0' W
2.	2000	RADAR	10° 23.5' N	86° 17.5' W
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400						
0500						
0600						
0700						
0800						
0900						
1000						
1100						
1200	9° 47.4' N	84° 49.0' W	130	4	175	1
1300	9° 36' N	84° 38.8' W	145	7	175	1
1400	9° 34' N	85° 19.8' W	200	7	175	1
1500	9° 41' N	85° 24.8' W	195	8	225	1
1600	9° 51'	85° 44'	195	7	220	1
1700	9° 59' N	85° 52' W	195	7	220	1
1800	10° 03' N	85° 59' W	320	14	320	3
1900	10° 12' N	86° 05' W	030	14	050	3
2000	10° 23.5'	86° 17' W	040	14	030	3
2100	10° 31.5'	86° 25' W	025	21	020	3
2200	10° 41.5'	86° 35'	030	20	030	3
2300	10° 50'	86° 44'	025	20	030	3
2400	11° N	86° 54'	020	15		

10 27
86 20.5

Date 31 AUG 67Ship ROCKAWAY (W-377)Cruise No. LEASTROPAC IIOrganization USCG

Recorder _____

Sunrise: Time 0540 Position: Lat. 11-52N Long. 87-47WSunset: Time 1803 Position: Lat. 11-08N, Long. 8800WMiles travelled from 0000 hours to sunrise = 40 miMiles travelled from sunrise to sunset = 83 miMiles travelled from sunset to 2400 hours = 3.6 miles

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	<u>0800</u>	<u>Celest.</u>	<u>12 04.5</u>	<u>87 59.7</u>
2.	<u>1200</u>	<u>"</u>	<u>11°56.0'N</u>	<u>88°02.6'W</u>
3.	<u>2000</u>	<u>11+D.R.</u>	<u>10 44.5N</u>	<u>87 58.5W</u>
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	<u>11°09'N</u>	<u>87°04'W</u>	<u>025</u>	<u>15</u>	<u>040</u>	<u>1</u>
0200	<u>11°13.2'N</u>	<u>87°10.3'W</u>	<u>010</u>	<u>18</u>	<u>030</u>	<u>1</u>
0300	<u>11°23.8'N</u>	<u>87°25'W</u>	<u>035</u>	<u>17</u>	<u>030</u>	<u>1</u>
0400	<u>11 32 N</u>	<u>87 35 W</u>	<u>035</u>	<u>17</u>	<u>030</u>	<u>1</u>
0500	<u>11 43 N</u>	<u>87 43 W</u>	<u>035</u>	<u>19</u>	<u>030</u>	<u>1</u>
0600	<u>11 47 N</u>	<u>87 53 W</u>	<u>035</u>	<u>12</u>	<u>030</u>	<u>1</u>
0700	<u>11 59 N</u>	<u>87 56 W</u>	<u>035</u>	<u>12</u>	<u>030</u>	<u>1</u>
0800	<u>12 04.5</u>	<u>87 59.7</u>	<u>035</u>	<u>21</u>	<u>030</u>	<u>2</u>
0900	<u>12 01.8</u>	<u>87 59.5</u>	<u>060</u>	<u>20</u>	<u>030</u>	<u>2</u>
1000	<u>11 55.5</u>	<u>87 59.5</u>	<u>060</u>	<u>15</u>	<u>030</u>	<u>2</u>
1100	<u>11 55.5</u>	<u>88 02</u>	<u>065</u>	<u>12</u>	<u>030</u>	<u>2</u>
1200	<u>11°56'N</u>	<u>88°02'W</u>	<u>130</u>	<u>10</u>	<u>015</u>	<u>2</u>
1300	<u>11°47.5'N</u>	<u>88°03'W</u>	<u>130</u>	<u>10</u>	<u>020</u>	<u>2</u>
1400	<u>11°40'N</u>	<u>88°02'W</u>	<u>130</u>	<u>10</u>	<u>020</u>	<u>2</u>
1500	<u>11°27'N</u>	<u>88 01'W</u>	<u>130</u>	<u>10</u>	<u>020</u>	<u>2</u>
1600	<u>11 21 N</u>	<u>88 00 W</u>	<u>130</u>	<u>09</u>	<u>020</u>	<u>3</u>
1700	<u>11 14 N</u>	<u>88 01 W</u>	<u>130</u>	<u>11</u>	<u>020</u>	<u>3</u>
1800	<u>11 09 N</u>	<u>88 00 W</u>	<u>135</u>	<u>14</u>	<u>020</u>	<u>3</u>
1900	<u>11 00 N</u>	<u>88 00 W</u>	<u>115</u>	<u>20</u>	<u>020</u>	<u>3</u>
2000	<u>10 44.5</u>	<u>87 58.5 W</u>	<u>090</u>	<u>10</u>	<u>100</u>	<u>2</u>
2100	<u>10 44.5</u>	<u>87 58.5</u>	<u>090</u>	<u>10</u>	<u>100</u>	<u>2</u>
2200	<u>10 45.5</u>	<u>87 58.5</u>	<u>090</u>	<u>10</u>	<u>100</u>	<u>2</u>
2300	<u>10 45.5</u>	<u>87 58.5</u>	<u>100</u>	<u>10</u>	<u>100</u>	<u>2</u>
2400	<u>"</u>	<u>"</u>	<u>100</u>	<u>10</u>	<u>100</u>	<u>1 1/2</u>

Date 1 SEPT 67 Ship ROCKAWAY () Cruise No.

Organization DSCG Recorder

✓ Sunrise: Time 0543 Position: Lat. , Long.

✓ Sunset: Time 1759 Position: Lat. , Long.

✓ Miles travelled from 0000 hours to sunrise = 35

✓ Miles travelled from sunrise to sunset = 29

Miles travelled from sunset to 2400 hours = 57.1

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	Celestial	10°04'N	88 23.5
2.	1200	CELESTIAL	09°45.1'N	88° 13.0'W
3.	2000	CELESTIAL	08°33.2'N	88° 03.0'W
4.				
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	10° 48'N	88-11.5W	090	13	-	-
0200	10° 38'N	88° 13.5W	090	16	-	-
0300	10° 31'N	88° 17.5W	030	14	-	-
0400	10-21N	88-18W	035	10	-	-
0500	10-21N	88-18W	035	15	-	-
0600	10-21N	88-18W	035	10	-	-
0700	10° 11'N	88-18.7W	065	11	010	2
0800	10 04N	88 23.5	045	7	190	2
0900	09 53	88 17.5	045	10	190	2
1000	9 47.5	88 13	145	7	190	2
1100	9 47.5	88 13	145	7	190	2
1200	9° 45'N	88° 12'W	130	6	190	1
1300	9° 38'N	88° 06'W	130	6	190	1
1400	9° 29.7N	88° 05.0'W	100	7	190	1
1500	9° 13.5N	88° 01.1'W	120	7	190	1
1600	9-01N	8800W	CALM	12	190	1
1700	"	"	190	6	195	1
1800	8-58.2	8804W	145	4	195	3
1900	8-45.5	88 04W	CALM	12	195	3
2000	8 34N	88 03	169	6	190	2
2100	8 21.5	88 01.5	169	5	190	2
2200	8 13N	88 01	169	5	190	2
2300	8 13N	88 01	210	4	180	2
2400	8° 11.6'N	88° W	215	8	-	-

Date 2 SEPT 67Ship Rockaway (W377)Cruise No Eastrop 2Organization USCG

Recorder _____

Sunrise: Time 0545 Position: Lat. 7-19N Long. 88WSunset: Time 1759 Position: Lat. 6°55N Long. 88WMiles travelled from 0000 hours to sunrise = 41Miles travelled from sunrise to sunset = 92Miles travelled from sunset to 2400 hours = 33.8

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0500	Celestial	6°56N	87 40.8
2.	1200	"	6°47.2'N	87°57.0'N
3.	2000	"	5 26	88 07
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
------	----------	-----------	-----------	----------	-----------	-----------

0100	8°00N	88W	240	8		
0200	7 17 N	88W	235	11		
0300	7 49.5 N	88W	235	10		
0400	7 33 N	88W	250	11	195	2
0500	"	"	250	7	195	2
0600	7 19 N	"	250	9	195	2
0700	7 12 N	"	250	10	190	2
0800	7 00	87 42	250	8	180	2
0900	6 49	87 47	250	8	200	2
1000	6 42	87 58	250	10	200	3
1100	6 42	87 58	250	10	200	3
1200	6°47.2'N	87°57.0'N	220	10	200	2
1300	6°42'N	88°W	220	8	200	2
1400	6°28.3'N	88°W	210	13	200	2
1500	6°14.5'N	88°W	220	11	200	2
1600	6°00N	88W	250	7	200	2
1700	6°00N	88W	270	6	200	2
1800	6°05N	"	270	9	200	2
1900	6 43 N	88W	265	10	200	2
2000	5 26	88 07	220	13	195	2
2100	5 17	88 07	220	14	220	2
2200	5 15	88	210	15	220	2
2300	5 15	88	210	15	220	2
2400	"	"	320	10	210	2

Date 3 SEPT 67Ship Rockaway (W-377)Cruise No. Eastropac IIOrganization USCGRecorder The Best✓ Sunrise: Time 0545 Position: Lat. _____, Long. _____✓ Sunset: Time 1757 Position: Lat. _____, Long. _____✓ Miles travelled from 0000 hours to sunrise = 54Miles travelled from sunrise to sunset = -Miles travelled from sunset to 2400 hours = 59.5

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
--	-------------	-------------	----------	-----------

1.	<u>2000</u>	<u>Radar</u>	<u>05°04'N</u>	<u>87°25'</u>
----	-------------	--------------	----------------	---------------

2.

3.

4.

5.

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
------	----------	-----------	-----------	----------	-----------	-----------

✓ 0100	5°18'N	87°59'W	240	15	210	2
0200	5°21.5'N	87°45'W	130	8	210	2
0300	5°25'N	87°36.7'W	220	12	240	3
✓ 0400	5°31'N	87.21.2W	200	12	240	2
✓ 0500	5°35.2'N	87.11.9W	200	11	240	3
✓ 0600			200	10	240	1
✓ 0700			255	2		
✓ 0800			260	2		
0900						
1000						
1100						
1200						
1300						
1400						
1500						
✓ 1600			200	6		
✓ 1700			180	10	180	2
✓ 1800			155	15	180	2
✓ 1900			150	13	180	2
2000	5 04	87 25	150	14	180	2
2100	4 56 N	87 35	150	14	180	2
2200	4 46	87 46	150	16	180	2
2300	4 36	87 56	150	16	180	2
2400	11	11	145	13	180	2

Date 4 SEPT 1967Ship Rockaway (4377)Cruise No Easterday IIOrganization USCG

Recorder _____

Sunrise: Time 0547 Position: Lat. 03-54N Long. 88 WSunset: Time 1753 Position: Lat. 02°-21.8'N Long. 88 WMiles travelled from 0000 hours to sunrise = 37 miMiles travelled from sunrise to sunset = 73Miles travelled from sunset to 2400 hours = 52.5

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	⊙ + D.R.	3° 26.2' N	88° 02.3' W
2.	1700	LAN + ⊙'s	3° 15.0' N	88° 04.3' W
3.	2000	omega	2° 04' N	88° 02' W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	4° 39' N	87° 57' W	170	17	190	1
0200	4° 29.5' N	87° 56.5' W	190	15	190	1
0300	4° 12' N	87° 57' W	190	15	190	1
0400	4-02 N	88 W	"	"	"	"
0500	3-54 N	88 W	"	"	"	"
0600	3-54 N	88 W	"	"	"	"
0700	3-36 N	88 W	"	10	"	2
0800	3 26.2	88 02.3	180	15	180	3.
0900	3 22	88 04	180	15	180	3
1000	3 22	88° 04' W	180	15	180	3
1100	3 22	88° 04' W	180	15	180	3
1200	3° 15' N	88° 04' W	175	18	180	3
1300	2° 02.5	88° 03' W	175	20	180	3
1400	2° 51.5' N	88° 02' W	175	15	180	3
1500	2° 40.1' N	88° W	175	15	180	2
1600	2-40 N	88 W	175	15	180	2
1700	2 35.0 N	88-01 W	165	15	180	2
1800	2 23 N	88 00 W	165	15	180	2
1900	2 08 N	88 00 W	175	15	180	2
2000	2 04	88 02	185	7	180	2
2100	2 04	88 02	185	10	180	1
2200	2 04	88 02	150	8	150	1
2300	2 03	88 02	150	8	150	1
2400	1° 46' N	88° W	155-	10	150	2

Date 5 SEPT 67Ship Rockaway W-377Cruise No. Eastpac 11Organization USCG

Recorder _____

Sunrise: Time 0547Position: Lat. 0-57NLong. 88-06WSunset: Time 1754Position: Lat. 0°00SLong. 88°00'WMiles travelled from 0000 hours to sunrise = 43Miles travelled from sunrise to sunset = 79Miles travelled from sunset to 2400 hours = 37.9

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1. 0800	CELESTIAL	0° 37.5' N	88° 02.0' W
2. 1200	C+HLAN	0° 22.4' N	88° 02.4' W
3.			
4. 2000	omega	0° 46' S	88° 06' W.
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	1° 36' N	88° W	150	10	150	2
0200	1° 25' N	88° W	145	10	150	2
0300	1° 14' N	88° W	150	10	150	2
0400	1-14.5N	88 W	150	15	150	2
0500	1-13.8N	88 04.5W	150	15	150	2
0600	0-57.1N	88 06 W	150	13	150	2
0700	0-45.1N	88 03 W	160	14	155	3
0800	0 37.5N	88 02 W	160	15	160	3
0900	0 31 N	88° W	160	15	160	3
1000	0 31 N	88° W	180	15	180	3
1100	0° 31.2 N	88 02 W	180	15	180	3
1200	0° 32.5' N	88° 02' W	185	15	175	3
1300	0° 12' N	88° 02' W	160	16	175	3
1400	0° 01' S	88° 02' W	160	14	175	3
1500	0° 12' S	88° 05' W	160	17	175	3
1600	11	11	160	17	180	3
1700	0 15 S	88 17 W	120	17	180	2
1800	0 22 S	88 00 W	170	15	180	3
1900	0-34 S	88 00 W	170	15	180	2
2000	0° 46.1 S	88° 06.0' W	175	15	180	3
2100	0 54 S	88 00	175	15	180	3
2200	0 54 S	88 00	175	15	180	3
2300	1° 50' 54 S	88 00	175	12	175	3
2400	1° S	88° W	175	15	180	3

150 all stop
155 8.4 KTS



Date 6 Sept Ship Rockaway (W-377) Cruise No. Eastpac II
 Organization USCG Recorder _____

✓ Sunrise: Time 0547 Position: Lat. _____, Long. _____
 ✓ Sunset: Time 1753 Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = 45

Miles travelled from sunrise to sunset = 75

Miles travelled from sunset to 2400 hours = 38.7

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELESTIAL	2°13.0'S	88°05.0'W
2.	1200	LAN + C	2°31'S	88°02.0'W
3.				
4.	2000	Celestial	3°45.5'S	88°01.0'W
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

✓ 0100	01° 15.8S	88°-06'W	155	14	170	3
✓ 0200	01° 27.5S	88°-06'W	140	15	150	3
✓ 0300	01° 39.5	88° 07.5W	150	14.5	160	3
✓ 0400	01-44.5S	88 08.2W	150	13	160	3
✓ 0500	01-44.5S	88 08.2W	150	13	160	3
✓ 0600	01° 54.5S	88° 07.5W	130	18	160	3
✓ 0700	02° 06.5S	88° 05.2W	130	15	160	3
0800	02 10	88 05	175	15	175	3
0900	02 25.5	88 03 W	175	15	175	3
1000	02 28	88 01	175	15	175	3
1100	02 30	88 00	175	15	175	3
1200	2°31'S	88°02'W	160	15	175	3
1300	2°43'S	88°W	160	14	165	3
1400	2°46.5'S	88°W	155	14	165	3
1500	3° 5	88°W	170	14	175	3
1600	3°05'S	88°02'W	170	12	175	3
1700	3°11'S	88°02'W	170	12	175	3
1800	3°25'S	88 02'W	155	16	170	3
1900	3°39'S	88°00'W	145	16	170	3
2000	3°45.5S	88 01.0W	145	15	170	1
2100	3 45	88	150	15	150	2
2200	3 45	88	150	15	150	2
2300	3 45	88	150	15	150	2
2400	11	11	145	15	150	2

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20 20,700 m. hr

Date 7 Sept 1967 Ship Rockaway (5377) Cruise No. Eastropac 2
 Organization United States Coast Guard Recorder Robert Shand

Sunrise: Time 0547 Position: Lat. 4 28.5 Long. 87.56 W
 Sunset: Time 1754 Position: Lat. 6 03.5 Long. 88 00 W

Miles travelled from 0000 hours to sunrise = 43

Miles travelled from sunrise to sunset = 95

Miles travelled from sunset to 2400 hours = 52.2

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELESTIAL	4° 52.0' S	87° 58.5' W
2.	1200	LAN + C	5° 11' S	88° 42.5' W
3.				
4.	2000	STARS	6° 19.7' S	87 57.5 W
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	3° 55.5' S	88° W	148	19	—	—
0200	4° 47' S	88° 02' W	135	19	—	—
0300	4° 15' S	88° 02' W	135	19	—	—
0400	4-165	88 W	122	18	140	3
0500	4-215	88 W	130	20	140	3
0600	4-355	88 W	135	20	140	3/1
0700	4-42	88 W	135	20	145	3/1
0800	4 52	87 58.5	130	15	160	3
0900	5 05	88	130	12	160	4
1000	5 05	88	140	12	160	4
1100	5 05	88	145	12	145	3
1200	5° 11' S	88° 42.2' W	145	20 15	150	3
1300	5° 20' S	88° 42.8' W	145	20	155	3
1400	5° 32' S	88° 00' W	125	23	140	3
1500	5 43	88 W	145	21	135	3
1600	5 57 S	88° 03' W	136	24	130	3
1700	5 57 S	88	140	20	130	3
1800	6 10 S	88	147	25	130	3
✓ 1900	6° 10' S	88° 59' W	145	23	130	3
2000	6° 19.7' S	87° 57.5' W	145	20	140	4
2100	6 32	87 57	140	20	140	4
2200	6 42	88 00	140	20	140	4
2300	6 42	88 00	140	20	140	4
2400	6° 46' S	88° W	130	15	—	—

Date 8 Sept 1967 Ship Rockaway (W-377) Cruise No. Eastropac 2
 Organization United States Recorder Coast Guard. HHA!

Sunrise: Time 0550 Position: Lat. 7°43'W, Long. 88°W
 Sunset: Time 1749 Position: Lat. 9°12'S, Long. 88°02'W

Miles travelled from 0000 hours to sunrise = 48

✓ Miles travelled from sunrise to sunset = 98

Miles travelled from sunset to 2400 hours = 58.1

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELESTIAL	08°05.5'S	88°01.5'W
2.	1200	LAN + C	8°15.5'S	88°02.7'W
3.	2000	CELESTIAL	9°37.3'S	88°02.0'W
4.				
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	7° 02'S	88°W	135	26	—	—
0200	7° 14'S	88°W	135	25	—	—
0300	7° 26'S	88°W	135	25	—	—
0400	7 28 S	88 W	135	20	125	3
0500	7 32 S	88 W	135	20	125	3
0600	7 44 S	88 W	126	23	125	4
✓ 0700	7° 44'S	88°-02.1'W	125	20	125	4
✓ 0800	7° 55'S	88°-02.6'W	135	24	130	4
✓ 0900	8° 06'S	88°-02.8'W	125	25	130	4
✓ 1000	8 07.0 S	88 03.0 W	135	20	120	2
✓ 1100	8° 08.5'S	88° 02.7'W	135	20	130	2
1200	8°15.5'S	88°02.7'W	130	19	135	5
1300	8°28' S	88°02.8'W	140	19	135	5
1400	8° 40.5'S	88°02'W	130	20	140	5
1500	8° 53'S	88°02'W	130	18	135	5
1600	8°56'S	88°02'W	130	18	135	4
1700	9°01'S	88°01'W	120	20	135	4
1800	9° 14	88°02'W	120	20	135	4
1900	9°26'S	88°02'W	135	17	135	4
2000	9 37.3 S	88 02.0 W	135	20	120	3
2100	9 42 S	88 W	120	20	120	3
2200	"	"	"	"	120	3
2300	9°49'S	88°W	125	20	125	3
2400	9°56'S	88°W	125	20	—	—

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Date 9 SEPT 1967 Ship Rockaway (W-377) Cruise No Eastropac 2
 Organization United States Recorder Coast Guard of America

Sunrise: Time 0550 Position: Lat. 10° 44.5, Long. 88 00 W

Sunset: Time 1746 Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = 51 miles

Miles travelled from sunrise to sunset = 83 mi

Miles travelled from sunset to 2400 hours = 38.7

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	<u>2000</u>	<u>Celestial</u>	<u>12 24 S</u>	<u>88 00.7</u>
2.	<u>1200</u>	<u>LANTO</u>	<u>11° 17.8'S</u>	<u>87° 58.7'W</u>
3.	<u>0800</u>	<u>CELES. + ELECTRONIC</u>	<u>11° 08.0'S</u>	<u>87° 57.0'W</u>
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	10° 06'S	88° W	128	26	—	—
0200	10° 20'S	88° W	11	11	—	—
0300	10° 28'S	88° W	11	11	—	—
0400	10 27.5	88 W	130	20	—	—
0500	10 33.5 S	88	130	20	130	2
0600	10 46.5	88	130	20	140	4
0700	10 48	88	125	25	140	4
0800	10 58 S	87.58'W	125	20	135	2
0900	11 02.0 S	87-58 W	120	15	135	2
1000	11 02.10 S	87-58 W	120	12	135	2
1100	11° 11.0 S	87.58 W	120	20	135	2
1200	11° 17.8'S	87.58.7W	120	20	135	2
1300	11 30.3 S	87° 59'W	120	22	130	2
1400	11° 42.8'S	88° W	120	22	130	2
1500	11° 50'S	88° W	120	19	125	2
1600	11 50 S	88	130	15	130	4
1700	12 05	88	130	15	130	4
1800	12 14	88	130	15	130	4
1900	12 27	88	130	15	130	4
2000	12 24	88 00.7	130	25	130	4
2100	11	11	11	11	11	3
2200	11	11	11	11	11	3
2300	11	11	11	11	11	3
2400	12° 37'S	88°	120	20	—	—

Date 10 SEPT 67 Ship Rockaway (W-377) Cruise No Eastropac 2
 Organization United States Coast Guard of America. Recorder

Sunrise: Time 0548 Position: Lat. 13 28, Long. 88 00

Sunset: Time 1747 Position: Lat. 15 00, Long. 88 00

Miles travelled from 0000 hours to sunrise = 48.5 mi.

Miles travelled from sunrise to sunset = 123 mi.

Miles travelled from sunset to 2400 hours = 62.5

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELES. & ELECT.	13° 43.0'S	88° 03.0'W
2.	1200	LAN + 10	14° 02.0'S	87° 57.0'W
3.	2000	CELES.	15° 00.0'S	88° 31.0'W
4.				
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	12° 49.5'S	88° W	120	22	—	—
0200	13° 02.0'S	88° W	130	30	—	—
0300	13° 14.5'S	88° W	125	28	—	—
0400	13 24	88	125	25	125	2
0500	13 24	88 00	125	15	125	4
0600	13 30	88 00	125	20	125	4
0700	13 42	88 00	125	20	125	4
0800	13 43	88 03	125	25	125	3
0900	14 00	88 06	125	25	125	3
1000	14° 11'	88 00	130	20	125	3
1100	14° 11'	88 00	130	20	125	3
1200	14° 05'	88° W	132	28	130	3
1300	14° 20.5'S	88° W	125	28	130	3
1400	14° 33'S	88° W	125	28	130	3
1500	14° 45'S	88° W	125	28	130	3
1600	14 47	88	125	25	130	5
1700	14 47	88	125	25	125	5
1800	14 56	88 14	125	25	125	5
1900	15° 00'S	88 19	130	25	130	5
2000	14° 57'S	88° 37.2W	130	20	125	4
2100	14° 56'S	88° 42.5W	130	22	129	4
2200	14° 57'S	88° 56.1W	130	25	127	4
2300	14° 58'S	89° 07.2W	130	24	135	4
2400	15° 05'	89° 19 W	130	20	130	5

$$\begin{array}{r} 37 \\ 12.5 \\ \hline 49 \end{array}$$

Date 11 SEPT 67 Ship Rockaway (W-377) Cruise No. Eastropac 2
 Organization United States Coast Guard of America Recorder

Sunrise: Time 0600 Position: Lat. 15°S, Long. 90°35'W
 Sunset: Time 1805 Position: Lat. 15°S, Long. 92°51'W

Miles travelled from 0000 hours to sunrise = 60.5 miles
 Miles travelled from sunrise to sunset = 135.2 miles
 Miles travelled from sunset to 2400 hours = 75.3

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELES. <u>0+DR</u>	14°58.0'S	90°52.8'W
2.	1200	<u>LAN+0</u>	14°57.0'S	91°39.8'W
3.	2000	CELES.	15°00 S	93°12' W
4.				
5.				

Early Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	15°S	89°32'W	140	25	—	—
0200	15°S	89°43'W	130	28	—	—
0300	15°S	89°55'W	130	25	—	—
0400	15°S	90°22'W	120	30	115	4
0500	15°S	90 22	"	"	"	"
0600	15°S	90 35	"	"	"	"
0700	15°S	90 43	"	"	"	"
0800	75 S	90 49 W	130	30	145	4
0900	"	91 04 W	130	30	145	4
1000	"	91 13 W	125	25	150	7
1100	"	91 25 W	129	30	150	6
1200	14°57'S	91°39'W	120	20	150	5
1300	14°57'S	91°57'W	120	25	150	5
1400	15°S	92°W	115	25	150	5
1500	15°S	92°13'W	115	25	145	8
1600	15°S	92°27'W	110	25	140	8
1700	15°S	92°38'W	125	28	140	8
1800	15°S	92°50'W	125	28	140	8
1900	15°S	93°01'W	125	23	140	8
2000	15	93 12	125	25	140	7
2100	15	93 24	125	25	140	7
2200	15	93 30	125	25	140	7
2300	15	93 41	125	25	140	7
2400	15 S	94 W	115	25	140	5

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Date 12 Sept 67 Ship Rockaway (W-37) Cruise No. Eastpac 2
 Organization United States Coast Guard of America Recorder port #1

Sunrise: Time 0619 Position: Lat. 12°15'S, Long. 95°W

Sunset: Time 1816 Position: Lat. 13°09'S, Long. 95°W

Miles travelled from 0000 hours to sunrise = 55.8 miles

Miles travelled from sunrise to sunset = 112.5 miles

Miles travelled from sunset to 2400 hours = 46.9

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	LAN + @	14° 48.5'S	95° 03.7'W
2.	1200	LAN + @	14° 15.5'S	95° 03.7'W
3.	2000	@ + DR	12° 47.0'S	95° 05.5'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	15° 5'	94° 13' W	125	29	125	2
0200	15° 5'	94° 24' W	125	28	125	2
0300	15° 5'	94° 37' W	125	28	125	2
0400	15° 5'	94° 48' W	150	25	140	6
0500	15° 5'	95° W	"	"	"	"
0600	15° 5'	95° W	120	25	140	7
0700	14° 49.5'S	95° W	120	25	125	7
0800	14° 41'S	95° W	"	"	"	"
0900	14° 28'S	95	095	30	"	"
1000	14° 34'S	95	095	20	"	"
1100	"	"	"	"	"	"
1200	14° 15.5'S	95° 03.7'W	095	25	130	8
1300	13° 54'S	95° 02' W	095	28	130	8
1400	13° 41.5'S	95° 02' W	095	28	130	8
1500	13° 29.0'	95° 02' W	095	25	130	8
1600	13° 36'S	95° 02' W	100	23	105	7
1700	13° 28.5'	95° W	090	26	105	7
1800	13° 12'S	95° W	103	25	105	7
1900	12° 38'S	95° W	103	25	105	7
2000	12° 47'S	95° 05.5'W	103	25	105	7
2100	"	"	"	"	"	"
2200	"	"	"	30	"	"
2300	"	"	105	20	"	"
2400	12° 43'S	"	105	20	110	8

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Date 13 SEPT 67Ship Rockaway (W-37)Cruise No. Eastropae 2Organization United States Coast Guard of AmericaRecorder Post #2Sunrise: Time 0615Position: Lat. 11°25'S, Long. 95°WSunset: Time 1817Position: Lat. 09°11', Long. 95°WMiles travelled from 0000 hours to sunrise = 63 milesMiles travelled from sunrise to sunset = 137.6 milesMiles travelled from sunset to 2400 hours = 90

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
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1.	0800	STARS + <u>0</u>	11° 08.0' S	95° 01.0' W
2.	1200	LAN 4 <u>0</u>	10° 44.8' S	95° 03.0' W
3.	2000	CELES	8° 45.0' S	95° 01.1' W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
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0100	12° 26'S	95° W	095	19	105	3
0200	12° 11'S	95° W	095	22	105	3
0300	11° 57'S	95° W	095	22	105	3
0400	11° 57'	95° W	095	22	105	6
0500	11° 42'	95° W	083	22	105	6
0600	11° 27'	95° W	083	22	105	6
0700	11 19	95° W	095	20	115	6
0800	11° 08' S	95° 01.0' W	095	25	115	6
0900	11° 08'S	95° 01.0' W	095	20	115	6
1000	11° 00'S	95° 01.5' W	085	25	115	5
1100	10° 51.5	95° 01.5' W	100	15	100	4
1200	10° 44.8'S	95° 03.0'S	100	15	100	2
1300	10° 29.8'S	95° 03'S	100	15	100	2
1400	10° 14.8'S	95° 03'S	095	17	100	2
1500	10° 5	95° 03'S	095	15	100	2
1600	09° 43'S	95° W	120	15	100	2
1700	9° 30.8'S	95° W	120	12	100	2
1800	9° 15.5'S	95° W	120	18	100	2
1900	9° 5	95° W	108	24/17	095	2
2000	8° 45'S	95° 02.0' W	115	15	090	2
2100	8° 30'S	95° 02.0' W	110	15	—	—
2200	8° 15'S	95° 02.0' W	115	15	—	—
2300	8° 00.	95° 02.0' W	117	15	—	—
2400	7° 44'S	95° W	120	15	—	—

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Date 14 SEPT 67Ship Rockaway (W-377)Cruise No. Castrospae 2Organization United States Coast GuardRecorder Shard of America

port #3

Sunrise: Time 0614Position: Lat. 6° 20'S, Long. 95° WSunset: Time 1817Position: Lat. 8° 51.2'S, Long. 95° WMiles travelled from 0000 hours to sunrise = 89.6 milesMiles travelled from sunrise to sunset = 170.7 milesMiles travelled from sunset to 2400 hours = 47.7

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	DR DR	6° 42.0'S	95° W
2.	1200	LAN + Q	7° 32.0'S	95° 00.0' W
3.	2000	DR DR	9° 13.0'S	95° W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	7° 30'S	95° W	120	16	115	2
0200	7° 15'S	95° W	100	15	115	2
0300	7° S	95° W	115	19	115	2
0400	6° 42'S	95° W	107	17	105	2
0500	6° 29'S	95° W	135	13.5	110	3
0600	6° 20'S	95° W	125	13.5	110	3
0700	6° 28'S	95° W	119	25	110	3
0800	6° 42'S	95° W	110	25	120	4
0900	6° 57'S	95° W	120	18	140	6
1000	7° 13'S	95° W	120	15	140	6
1100	7° 28'S	95° W	120	15	145	5
1200	7° 32.0'S	95° W	120	15 15	130	5
1300	7° 47.5'S	95° W	120	23	130	5
1400	8° S	95° W	110	23	130	4
1500	8° 12.5'S	95° W	105	24	130	4
1600	8° 25'S	95° W	110	24	120	4
1700	8° 37.5'S	95° W	095	26	110	2
1800	8° 47.2'S	95° W	120	22	105	4
1900	9° 00.5'S	95° W	120	24	105	4
2000	9° 13.0'S	95° W	100	20	105	4
2100	9° 25.0'S	"	100	20	105	4
2200	"	"	110	20	105	4
2300	"	"	110	15	105	3
2400	9° 36'S	95° W	115	21	130	3

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Date 15 Sept 67 Ship Rockaway W-377 Cruise No. Eastropac 2
 Organization United States Coast Guard of America Recorder Port #4

Sunrise: Time 0615 Position: Lat. 10°09.2'S Long. 95°W

Sunset: Time 1817 Position: Lat. 7°55'S, Long. 95°W

Miles travelled from 0000 hours to sunrise = 52.5 miles

Miles travelled from sunrise to sunset = 130.9 miles

Miles travelled from sunset to 2400 hours = 15.6

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	$\star + \odot$	9°37'S	95°W
2.	1200	LAN + \odot	8°45'S	95°04.5'W
3.	2000	CELES	7°50.0'S	95°03.0'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	9°46'S	95°W	112	23	130	4
0200	9°58'S	95°W	108	24	130	4
0300	10°11'S	95°W	108	24	130	3
0400	10°18.5'S	95°W	120	29	135	3
0500	10°17.3'S	95°W	120	19	135	3
0600	10°06'S	95°W	120	16	130	3
0700	09°52'S	95°W	120	16	130	3
0800	9-41'S	95°W	120	20	130	4
0900	9-25'S	95°W	120	15	130	4
1000	9-12'S	95°W	100	17	130	3
1100	9-01'S	95°W	100	15	130	2
1200	8°45'S	95°W	112	15	125	2
1300	8°38'S	95°W	130	18	125	3
1400	"	"	105	16	115	2
1500	8°33'S	95°W	105	16	115	2
1600	8°21.3	95°W	110	16	115	3
1700	8°10'S	95°W	120	13	120	3
1800	7°58'S	95°W	108	12	120	3
1900	7°47.5'S	95°W	108	12	125	3
2000	7°50'S	95°W	105	10	125	4
2100	"	"	"	"	"	"
2200	"	"	"	"	"	"
2300	7°48'S	95°W	"	"	"	"
2400	7°43'S	95°W	110	12	100	2

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Date 16 Sept 67 Ship Rockaway W-377 Cruise No. Eastpac 2
 Organization United States Coast Guard Recorder Harold of America Post # 5

Sunrise: Time 0613 Position: Lat. 6°44'S, Long. 95°W

Sunset: Time 1817 Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = 71.3 Miles

Miles travelled from sunrise to sunset = 97.3

Miles travelled from sunset to 2400 hours = 39.5

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	DR + ⊙	6°28'S	95°03'W
2.	1200	LAN + ⊙	5°50.7'S	95°09.0'W
3.	2000	* + DR	4°32.0'S	95°04.5'W
4.				
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	7°32'S	95°W	110	14	—	—
0200	7°19'S	95°W	110	15	—	—
0300	7°07'S	95°W	110	15	—	—
0400	6°56'S	95°W	130	16	—	—
0500	6°56'S	95°02'	130	16	—	—
0600	6°45'S	95°W	130	12	—	—
0700	6°33.5'S	95°W	130	12	—	—
0800	6°28'S	95°03'W	130	12	115	2
0900	6°07'S	"	"	"	"	"
1000	6°07'S	"	"	"	"	"
1100	6°07'S	"	"	"	"	"
1200	5°50.7'S	95°09'W	120	15	120	3
1300	5°40.7'S	95°07'W	115	13	120	2
1400	5°28'S	95°05'W	110	14	120	2
1500	5°16'S	95°02'W	120	14	125	2
153 1600	5°06'S	95°03'W	140	8	135	2
1700	5°06'S	95°03'W	130	12	135	3
1800	4°54'S	95°W	130	16	135	3
STD 133 1900	4°37.7'S	95-05.5W	130	14	145	2
2000	4°27'S	95°04'W	120	12	120	2
2100	4°20'S	95°00'W	125	10	120	2
2200	4°20'S	95°00'W	140	10	120	2
2300	"	"	125	12	120	2
2400	4°15'S	95°03'W	140	15	120	3

7° 23' 5"
95-00

Date 17 Sept 67 Ship Rockaway (W-377) Cruise No. Eartropac 2
 Organization United States Coast Guard of America Recorder port #6

Sunrise: Time 0612 Position: Lat. 3°10'S, Long. 95°W

Sunset: Time 1818 Position: Lat. 1°27'S, Long. 95°W

Miles travelled from 0000 hours to sunrise = 48.6 miles

Miles travelled from sunrise to sunset = 110.1 miles

Miles travelled from sunset to 2400 hours = 26.8

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	* + ⊙	2°49'S	94°59'W
2.	1200	LAN + ⊙	2°31.1'S	95°01.2'W
3.	2000	CFLS, ELEC.	1°02.0'S	95°00.5'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	4°02.5'S	95°02'W	140	15	130	2
0200	3°50'S	95°03'W	140	15 19	125	2
0300	3°38'S	95°03'W	140	19	125	2
0400	3°34'S	95°03'W	135	9	125	1
0500	3°27'S	95°03'W	135	9	125	1
0600	3°18'S	95°W	142	9	125	1
0700	3°5	95°W	172	9	145	1
0800	2°49'S	94°59'W	163	10	145	1
0900	2°40'S	95°W	145	10	140	1
1000	2°40'S	95°W	125	10	140	1
1100	2°35'S	95°00.5'W	125	10	140	2
1200	2°31.1'S	95°01.2'W	140	10 14	140	2
1300	2°22'S	95°W	140	10 14	140	2
1400	2°10'S	95°W	145	14	140	2
1500	1°53'S	95°W	135	14	140	2
1600	1°52'S	95°W	135	13	145	2
1700	1°42'S	95°W	135	13	145	2
1800	1°30'S	95°W	150	10	145	2
1900	1°16'S	95°W	140	10	140	2
2000	1°02.5	95°00.5'W	130	10	135	2
2100	"	"	130	10	135	1
2200	"	"	120	10	135	2
2300	"	"	"	"	"	"
2400	0°57'S	95°W	125	12	135	2

Date 18 Sept 67 Ship Rockaway (W-377) Cruise No. Eastpac 2
 Organization United States Coast Guard of America Recorder Post # 7

Sunrise: Time 0612 Position: Lat. 0°21'S, Long. 95°W

Sunset: Time 1818 Position: Lat. 1°11'N, Long. 95°W

Miles travelled from 0000 hours to sunrise = 32.6 miles

Miles travelled from sunrise to sunset = 87.3 miles

Miles travelled from sunset to 2400 hours = 51.7

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0000	CELES	0°04.0'S	95°05.0'W
2.	<u>0800</u>	<u>R HOR</u>	<u>0°04.0'S</u>	<u>95°05.0'W</u>
3.	<u>1200</u>	<u>LAW + C</u>	<u>0°23.0'N</u>	<u>95°06.3'W</u>
4.	<u>2000</u>	<u>CELES</u>	<u>1°32.0'N</u>	<u>95°00.0'W</u>
5.				

Hourly Positions

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	0°57'S	95°W	120	5	135	2
0200	0°53.5'S	95°W	120	8	135	2
0300	0°40.6'S	95°W	130	13	135	2
0400	0°33'S	95°W	170	8	145	2
0500	0°21'S	95°W	170	8	170	2
0600	0°21'S	95°W	170/155	11	170	2
0700	0°15.5'S	95°W	158	12	170	1
0800	0-04 S	95-05 W	170	10	175	1
0900	0 09 S	95 00 W	"	"	"	1
1000	0 23 N	95 00 W	"	"	"	1
1100	0 23 N	95 00 W	"	"	"	1
1200	0°23.0'N	95°06.3'W	150	14	120	1
1300	0°26.4'N	95°W	155	13	150	1
1400	1°37.5'N	95°W	150	13	150	1
1500	0°47'N	95°W	155	8	150	1
1600	0°59'N	95°W	160	8	180	1
1700	1°10'N	95°W	155	8	180	1
1800	1°10'N	95°W	155	8	180	1
1900	1°21'N	95°W	155	8	180	1
2000	1°32'N	95°W	155	10	"	"
2100	1°55'N	95°W	"	"	"	"
2200	"	"	CHL W	"	"	"
2300	"	"	155	10	"	"
2400	1°58'N	95°W	180	8	180	2

²
53.15
12.9
40.6

Date 19 Sept 67 Ship Rockaway W-377 Cruise No. Eastpac 2
 Organization United States Coast Guard of America Recorder port #8

Sunrise: Time 0611 Position: Lat. 2° 50'S Long. 95°W

Sunset: Time 1817 Position: Lat. 4° 25'N Long. 95°W

Miles travelled from 0000 hours to sunrise = 61.5 miles

Miles travelled from sunrise to sunset = 130.8 miles

Miles travelled from sunset to 2400 hours = 34.5

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	LAN+D	3° 03'N	94° 43'W
2.	1200	LAN+D	3° 25'N	94° 46'W
3.	2000	D+DR	4° 43.5'N	94° 59'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	2° 07'N	95°W	180	8	180	1
0200	2° 17.5'N	95°W	180	14	180	1
0300	2° 28'N	95°W	200	13	180	1
0400	2° 40'N	95°W	185	13	180	2
0500	2° 40'N	95°W	195	10	180	2
0600	2° 48.5'N	95°W	216	13	185	2
0700	2° 02'N	95°W	210	13	195	2
0800	3° 09'N	95°W	"	10	200	1
0900	3° 25'N	95°W	200	10	200	2
1000	"	"	"	"	200	2
1100	"	"	"	"	"	"
1200	3° 25.0'N	94° 46.0'W	205	13	195	2
1300	3° 37.5'N	94° 51.5'W	195	14	195	1
1400	3° 48'N	94° 55'W	195	14	195	1
1500	3° 58'N	94° 58'W	200	17	195	2
1600	3° 59'N	95°W	232	16	185	1
1700	4° 12'N	95°W	205	16	190	1
1800	4° 21'N	95°W	205	16	190	1
1900	4° 34'N	95°W	230	15	190	1
2000	4° 43.5'N	94° 59'W	190	15	"	"
2100	"	"	"	"	"	"
2200	"	"	"	"	"	"
2300	"	"	"	"	"	"
2400	4° 47'N	95°W	"	14	"	"

S/R 92,000
A-7 25,850
2851

Date 20 Sept 67 Ship Rockaway W-37 Cruise No. East Pacific 2
 Organization United States Coast Guard port # 9

Sunrise: Time 0610 Position: Lat. 5°41'N, Long. 95°W

Sunset: Time 1818 Position: Lat. 7°35'N, Long. 95°W

Miles travelled from 0000 hours to sunrise = 47.7 miles

Miles travelled from sunrise to sunset = 125.8 miles 23

Miles travelled from sunset to 2400 hours = 50.7

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0610 0800	— —	6°14.2'N	94°51'W
2.				
3.	1200	—	6°34.0'N	94°52'W
4.	2000	ELEC	8°07.0'N	94°58.0'W
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	4°58.5'N	95°W	190	13	190	1
0200	5°12'N	95°W	225	9	190	1
0300	5°25'N	95°W	220	5	190	1
0400	5°34'N	95°W	200	10	190	1
0500	5°34'N	95°W	200	8	195	1
0600	5°39.8	95°W	200	15	195	1
0700	5°53'N	95°W	230	10	200	1
0800	6°14.7N	94°51.0W	258	17	190	1
0900	6°28'N	94°52'W	261	14	200	1
1000	"	"	"	13	"	"
1100	"	"	"	14	240	1
1200	6°34'N	94°52'W	281	15	260	1
1300	6°34'N	94°54'W	270	9	260	1
1400	6°52.3'N	94°58'W	265	5	260	1
1500	7°05.6'N	94°58'W	250	5	300	1
1600	7°14'N	94°59'W	250	4	3290	1
1700	7°19'N	95°W	245	10	295	1
1800	7°31'N	95°W	240	10	270	1
1900	7°44'N	95°W	240	10	270	1
2000	8°07.0N	94°48'W	240	4	270	1
2100	8°04'N	95°00'W	11	"	"	"
2200	"	"	CHLW	"	"	"
2300	8°05'N	95°00'W	305	4	265	1
2400	8°21'N	95°W			260	1

Date 21 Sept 67 Ship Rockaway W-377 Cruise No. Eastpac 2
 Organization USCG Recorder _____

Sunrise: Time 0649 Position: Lat. 9°21'N, Long. 95°W
 Sunset: Time 1816 Position: Lat. 11°23'N Long. 95°W

Miles travelled from 0000 hours to sunrise = 60.0 miles

Miles travelled from sunrise to sunset = 110.4 miles

Miles travelled from sunset to 2400 hours = 15.3

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0700	<u>L</u>	10-02'N	95-02'W
2.	10-21-0'			
3.	1200	CELES	10° 21.0' N	95° 03.5' W
4.	2000	CELES	11° 37.0' N	95° 01.5' W
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	8° 34' N	95° W	355	5	260	1
0200	8° 47' N	95° W	000	7	260	1
0300	8° 54' N	95° W	080	8	260	1
0400	8° 56' N	95° W	000	7	260	1
0500	8° 08' N	95° W	000	7	260	1
0600	9° 19' N	95° W	310	3	230	1
0700	9° 32' N	95° W	288	12	270	1
0800	10 02 N	95 02 W	280	20	280	2
0900	"	"	270	12	280	11
1000	10 09 N	95 W	370	11	11	11
1100	10 15 N	95 W	314	15	11	"
1200	10° 21.0' N	95° W	310	14	300	2
1300	10° 34' N	95° W	310	13	300	2
1400	10° 47' N	95° W	310	3	300	2
1500	10° 48.5' N	95° W	310	3	300	2
1600	10° 50' N	95° W	315	8	315	2
1700	11° 02' N	95° W	040	8	285	3
1800	11° 20' N	95° W	080	8	295	3
1900	11 37 N	95 01 W	150	5	295	3
2000	11 37 N	95 01 W	150	5	295	3
2100	"	"	"	"	270	"
2200	"	"	"	"	265	2
2300	"	"	"	7	265	2
2400	11° 51' N	95° W	160	6	310	2

fade

S/R 105

ALT 28,900

Date 22 Sept 67 Ship Rockaway (W-377) Cruise No Eastropar 2
 Organization USCG Recorder

Sunrise: Time 0609 Position: Lat. 12°42'N Long. 95°W

Sunset: Time 1816 Position: Lat. 14°40'S, Long. 95°W

Miles travelled from 0000 hours to sunrise = 48.3 miles

Miles travelled from sunrise to sunset = 128.7 miles

Miles travelled from sunset to 2400 hours = 52.2

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELES	13°15.6'N	95°01.5'W
2.	1200	LAN + 0	13°33.5'N	95°08.5'W
3.	2000	CELES.	15°00.0'N	94°59.5'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
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0100	11°54'N	95°W	225	7	260	2
0200	12°08'N	95°W	225	7	265	2
0300	12°20.5'N	95°W	195	4	265	2
0400	12°29'N	95°W	200	5	270	3
0500	12°29'N	95°W	230	5	300	3
0600	12°40'N	95°W	230	4	275	3
0700	12°39'N	95°W	230	4	260	3
0800	13°15.6'N	95°01'W	230	4	260	3
0900	13°19'N	"	170	8	11	11
1000	"	"	11	11	11	2
1100	13°24'N	11°00'W	11	7	11	3
1200	13°33.5'N	95°08.5'W	180	6	260	2
1300	13°46.5'N	95°W	180	6	260	2
1400	13°56.5'N	95°W	165	18	240	2
1500	14°09'N	95°W	185	10	242	2
1600	14°13'N	95°W	213	11	230	2
1700	14°24.8'N	95°W	190	7	215	1
1800	14°38.5'N	95°W	205	8	245	2
1900	14°51.5'N	95°W	235	8	245	2
2000	15°00.0'N	94°59.5'W	220	9	245	2
2100	15°57'N	94°55'W	"	"	"	11
2200	14°58'N	94°45'W	220	3	245	2
2300	14°58'N	94°41'W	195	8	11	11
2400	14°48'N	94°28'W	235	7	245	2

29600
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921 26

Date 23 SEPT 67 Ship Rockaway (W-37) Cruise No. Eastpac 2
 Organization USCG Recorder _____

Sunrise: Time 0601 Position: Lat. 14° 20.5' N Long. 92° 58' W

Sunset: Time 1816 Position: Lat. 13° 29' N Long. 89° 20' W

Miles travelled from 0000 hours to sunrise = 90 miles

Miles travelled from sunrise to sunset = 158.2 miles

Miles travelled from sunset to 2400 hours = 77.0

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	ELEC & CELES	14° 12.5' N	92° 29.3' W
2.	1200	LAN + Q + R RANGE	13° 54.3' N	91° 35.0' W
3.	2000	ELEC	13° 23.8' N	89° 55.0' W
4.				
5.				

Hourly Positions: YES

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100	14° 43.7' N	94° 11' W	215	7	220	2
0200	14° 39.2' N	93° 56.6' W	215	7	220	2
0300	14° 34.8' N	93° 42' W	340	7	220	2
0400	14° 30' N	93° 27'	290	6	225	2
0500	14° 25'	93° 12.5'	825	26	225	2
0600	14° 20.5'	92° 58'	325	25 15	220	2
0700	14° 16' N	92° 44'	325	15	220	2
0800	14° 12.5' N	92° 29.3' W	135	17	"	3
0900	14° 08.5' N	92° 18' W	134	7	170	2
1000	14° 02.5' N	92° 05' W	134	7	176	3
1100	13° 58' N	91° 42' W	000	5	185	3
1200	13° 54.3' N	91° 35.0' W	108	3	200	1
1300	13° 50.7' N	91° 22.6' W	200	9	200	1
1400	13° 46.8' N	91° 10.4' W	200	10	200	1
1500	13° 42.7' N	90° 58.0' W	200	10	200	1
1600	13° 45'	90° 45'	205	10	290	1
1700	13° 31.4' N	90° 09.0' W	205	10	170	1
1800	13° 31' N	90° 22' W	205	10	175	1
1900	13° 27.5'	90° 09.5'	290	3	180	1
2000	13° 23.8' N	89° 55' W	"	4	180	1
2100	13° 20.4' N	89° 42' W	300	2	"	1
2200	13° 16.4' N	89° 29.7' W	310	2	"	"
2300	13° 13.3' N	89° 17.0' W	"	4	"	"
2400	13° 10.1' N	89° 05.4' W	040	11	180	1

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13° 10' N

89 01

Date 24 SEPT 67 Ship Rockaway 4377 Cruise No. Eastpac 2
Organization USCG Recorder _____

Sunrise: Time 0541 Position: Lat. 13°04'N Long. 87°57'W

Sunset: Time 1747 Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = 75 miles

Miles travelled from sunrise to sunset = _____

Miles travelled from sunset to 2400 hours = _____

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
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1.	0800	ELEC, VISUAL	13° 20.3'N	87°49.2'W
----	------	--------------	------------	-----------

2.

3.

4.

5.

LA UNION

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
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0100	13°06.8'N	88°52.9'W	075	12	180	1
0200	13°03.2'N	88°40.5'W	075	12	180	2 1
0300	13° N	88°27.5'W	085	12	195 180	2 1
0400	13°01'N	88°09'	090	12	195	1
0500	13°02'N	88°09.6'W	028	10	120	1
0600	13°07'N	87°51'W	028	10	120	1
0700	13°15'N	87°47.5'W	030	10	045	1/2
0800						
0900						
1000						
1100		ANCHORED OFF				
1200		LA UNION				
1300		EL SALVADOR				
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						

WAVE

Date 22 Sept 67 Ship Rockaway (WAG 377) Cruise No. _____
 Organization _____ Recorder _____

Sunrise: Time 0540 Position: Lat. _____, Long. _____

Sunset: Time 1740 Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = _____

Miles travelled from sunset to 2400 hours = 103.3 miles

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	<u>1200</u>	<u>①</u>	<u>12° 08.5' N</u>	<u>87° 17.0' W</u>
2.	<u>0800</u>	<u>VIS</u>	<u>13° 08.5' N</u>	<u>87° 46.6' W</u>
3. #2		<u>elect.</u>	<u>10 20.6 N</u>	<u>86 09 W</u>
4.	<u>2000</u>			
5.				

Hourly Positions:

Time Latitude Longitude Wind Dir. Wind Sp. Wave Dir. Wave Hgt.

0100						
0200						
0300						
0400						
0500						
0600						
0700						
0800	<u>13 08</u>	<u>87 40</u>	<u>ANCHORED</u>	<u>OFF</u>		
0900	<u>12 57.7</u>	<u>87 48</u>	<u>CALM</u>	<u>3</u>	<u>CALM</u>	
1000	<u>12 39</u>	<u>87 36</u>	<u>"</u>	<u>-</u>		
1100	<u>12 25.5</u>	<u>87 26</u>	<u>"</u>	<u>-</u>		
1200	<u>12° 08.5' N</u>	<u>87° 17' W</u>	<u>CALM</u>	<u>-</u>	<u>260</u>	<u>1</u>
1300	<u>11° 57.5'</u>	<u>87° 08' W</u>	<u>"</u>	<u>-</u>	<u>300</u>	<u>1</u>
1400	<u>11° 44' N</u>	<u>86° 58' W</u>	<u>"</u>	<u>-</u>	<u>285</u>	<u>1</u>
1500	<u>11° 30' N</u>	<u>86° 50' W</u>	<u>"</u>	<u>-</u>	<u>255</u>	<u>1</u>
1600	<u>11 19 N</u>	<u>86 42 W</u>	<u>"</u>	<u>-</u>	<u>255</u>	<u>1</u>
1700	<u>11° 07' N</u>	<u>86° 34' W</u>	<u>"</u>	<u>-</u>	<u>265</u>	<u>1</u>
1800	<u>10 50 N</u>	<u>86 22 W</u>	<u>"</u>	<u>-</u>	<u>265</u>	<u>1</u>
1900	<u>10 39.3 N</u>	<u>86 16 W</u>	<u>330</u>	<u>2</u>	<u>265</u>	<u>1</u>
2000	<u>10 20.6 N</u>	<u>86 09 W</u>	<u>087</u>	<u>15</u>	<u>-</u>	<u>-</u>
2100	<u>10 01 N</u>	<u>85 55 W</u>	<u>090</u>	<u>15</u>	<u>-</u>	<u>-</u>
2200	<u>09 54 N</u>	<u>85 51.5 W</u>	<u>093</u>	<u>20</u>	<u>-</u>	<u>-</u>
2300	<u>09 43 N</u>	<u>85 41 W</u>	<u>093</u>	<u>20</u>	<u>-</u>	<u>-</u>
2400	<u>09 34 N</u>	<u>85 28.5</u>	<u>210</u>	<u>10</u>	<u>180</u>	<u>1</u>

alone

10/3
3021
814.3
103.3

Date Sept 28 1967 Ship Rockaway (WAGO-377) Cruise No. _____
 Organization U.S.C.G. Recorder _____

Sunrise: Time 0525 Position: Lat. 84°15'N, Long. 84°12'W
 Sunset: Time 1719 Position: Lat. 70°5'N, Long. 81°39'W

Miles travelled from 0000 hours to sunrise = 91.3

Miles travelled from sunrise to sunset = 199

Miles travelled from sunset to 2400 hours = 105.2 miles

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	815 + ELEEC	8°16.5'N	83°47.2'W
2.	1200	VIS + ELEEC	7°36.2'N	82°51.5'W
3.				
4.	2000	Radar	7°03.5'	80°45.7'
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
------	----------	-----------	-----------	----------	-----------	-----------

0100	9°23'N	85°12.5'	210	10	185	1
0200	9°14'N	84°58.5'	205	10	185	1
0300	9°05'N	84°46'W	085	6	155	1
0400	8°55'N	84°32'W	220	12	155	2
0500	8°45'N	84°19'W	185	12	155	1
0600	8°35'N	84°05'W	099	24	155	2
0700	8°25'N	83°52'W	099	24	155	1
0800	8°16.5'	83°47.2'	113	15	155	1
0900	8°07'	83°33'	140	11	155	1
1000	7°57'	83°20'	140	11	155	1
1100	7°47.5'	83°09.5'	053	10	165	1
1200	7°36.2'	82°51.5'	210	6	150	1
1300	7°26'N	82°38'	"	"	"	"
1400	7°20'N	82°23'	"	"	"	3
1500	7°15'N	82°12'	217	14	225	3
1600	7°07'N	81°52'W	212	15	"	"
1700	7°05'N	81°36'W	214	14	"	"
1800	7°05'N	81°20'W	240	10	"	"
1900	7°05'N	81°09'W	245	10	"	"
2000	7°03.5'	80°45.7'	253	16	"	"
2100	7°03.5'	80°28.5'	253	16	"	"
2200	7°8.5'	80°14'	250	16	"	"
2300	7°15'	80°00'	250	16	"	"
2400	7°29'N	79°55'	215	15	240	2

Wave
11
11

16.6
5.5
83.0
83.0
97.30

16.6
12
332
166
1992

f

3

4

5.

2

5

2

10TH

Date 29 Sept 1967 Ship Rachaway (WAGO-37) Cruise No. _____
Organization USCG Recorder _____

Sunrise: Time 0509 Position: Lat. _____, Long. _____

Sunset: Time _____ Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = 62 mi

Miles travelled from sunrise to sunset = _____

Miles travelled from sunset to 2400 hours = _____

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
--	-------------	-------------	----------	-----------

1.

MOORED RODMAN NAVAL BASE

2.

PANAMA CANAL ZONE

3.

4.

5.

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
------	----------	-----------	-----------	----------	-----------	-----------

0100	7° 40'	79° 50'	220	15	240	2
0200	7° 56.5'	79° 45' W	200	6	230	2
0300	8° 14' N	79° 39' W	265	7	230	2
0400	8 29 N	79 24 W	200	8	230	1
0500						
0600						
0700						
0800						
0900						
1000						
1100						
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						

Date Sept 30, 1967 Ship Rockaway () Cruise No. _____
Organization VLLA Recorder _____

Sunrise: Time 0609 Position: Lat. 9°39'N, Long. 79°43'W

Sunset: Time _____ Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = _____

Miles travelled from sunset to 2400 hours = _____

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
--	-------------	-------------	----------	-----------

1.

2.

3.

4.

5.

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
------	----------	-----------	-----------	----------	-----------	-----------

0100	9°41'N	79°46	050	9	050	1
0200						
0300						
0400						
0500	9°27'N	79°54'	045	9	030	1
0600	9°41'N	79°46	050	9	050	1
0700	9°57'N	79°37				
0800						
0900						
1000						
1100						
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						



4
15.7
5.9
9.8

PHYSICAL OCEANOGRAPHIC DATA
NOON (L.A.N.) STATION POSITIONS
EASTROPAC - USCGC ROCKAWAY
AUGUST 1967

DATE	STATION	ON STATION TIME (LOCAL)	LAT.	LONG	SECCHI DEPTH (METERS)	SURFACE TEMP (°C)	OCEANOGRAPHIC DATA SALINITY (PPT) ‰	LAYER DEPTH (METERS)
1	PANAMA	—	—	—	—	—	—	—
2	47011	1014	06-50N	079-16W	30	27.40	31.154	0 (NONE)
3	47025	1108	05-41N	080-31W	25	26.60	31.971	38
4	47034	0910	03-19N	079-44W	19.8	26.18	33.155	36
5	47049	1435	01-00N	082-00W	22	25.00	33.925	30
6	47061	0900	01-11S	082-02W	11	23.90	33.414	15
7-9	GUAYAQUIL, ECUADOR	—	—	—	—	—	—	—
10	47078	0920	04-39S	082-03W	8	19.79	34.825	0
11	47094	0900	07-28S	081-57W	23	18.11	35.187	44
12	47103	0900	10-09S	082-09W	22	17.95	35.254	42
13	47113	0900	09-22S	079-39W	15	16.10	35.044	44
14-16	CALLAO, PERU	—	—	—	—	—	—	—
17	47134	0900	12-56S	079-28W	20	16.47	35.209	0
18	47143	0835	13-58S	082-25W	23	17.41	35.300	43
19	47151	0800	14-56S	085-00W	19	17.84	35.355	0
20	47159	0830	12-07S	084-59W	19	17.80	35.306	0
21	47168	0835	09-17S	085-07W	22	18.71	35.315	50
22	47177	0808	06-35S	085-09W	17	17.95	35.092	0
23	47189	0900	03-51S	085-01W	12	18.40	35.037	0
24	47205	0900	00-40S	085-04W	21	23.43	34.270	20
25	47221	0900	02-08N	084-57W	25	25.89	33.952	28
26	47237	0900	05-07N	084-45W	11	26.71	31.963	15
27	47246	0950	07-43N	085-04W	11	27.38	34.029	0
28-30	PUNTARENAS, COSTA RICA	—	—	—	—	—	—	—
31	47268	0935	11-58N	088-02W	25	27.80	33.049	0

PHYSICAL OCEANOGRAPHIC DATA
NOON (L.A.N.) STATIONS- EASTROPAC
USCGC ROCKAWAY
SEPTEMBER 1967

DATE	STATION	ON STATION TIME	LAT	LONG.	SECCHI DEPTH (METERS)	SURFACE TEMP (°C)	OCEANOGRAPHIC SALINITY (PPT) ‰	DATA LAYER DEPTH (M)
1	47280	0955	09-45N	88-14W	9	26.19	34.095	NONE
2	47290	1010	06-47N	87-57W	17	26.74	32.835	15
3	COCOS ISLAND							
4	47304	0915	03-22N	88-04W	30	26.20	33.539	28
5	47318	0940	00-34N	88-02W	28	23.64	34.842	20
6	47334	0950	02-24S	88-02W	14	18.50	34.860	20
7	47349	0940	05-10S	88-02W	20	18.58	35.250	55
8	47359	0915	08-07S	88-03W	20	19.01	35.262	20
9	47369	0830	11-02S	87-58W	23	18.19	35.342	68
10	47379	0927	13-57S	87-57W	23	18.60	35.462	75
11	TRANSIT LEG							
12	47404	0952	14-17S	95-03W	23	20.09	35.691	100
13	47415	0755	11-07S	95-02W	23	20.56	35.451	91
14	RENDEZVOUS WITH <u>SOMERSET</u>							
15	47436	1300	08-32S	95-02W	35	20.99	35.331	78
16	47443	0915	05-55S	95-08W	28	20.69	35.256	63
17	47458	0825	02-41S	95-00W	24	18.51	35.029	NONE
18	47474	1030	00-23N	95-07W	21	22.61	34.470	6
19	47490	0904	03-16N	94-41W	34	25.80	33.725	32
20	47504	0925	06-27N	94-59W	19	26.60	33.602	NONE
21	47513	0755	09-49N	95-05W	17	25.99	33.852	NONE
22	47523	0818	13-16N	95-01W	21	27.89	33.264	7

EASTROPAC - CGC ROCKAWAY
AUGUST - SEPTEMBER 1967
TOTAL # BIRDS BY SPECIES BY AREA

	AREA 1	2	3	4	5	TOTAL # / SPECIES
BROWN BOOBY	30	40	306	0	38	414
RED FOOTED BOOBY	0	0	1040	0	63	1103
BLUE FACED BOOBY	1	0	1	1	57	60
PERUVIAN BOOBY	0	6	0	0	0	6
UNID. BOOBY	0	0	2	1	1	4
LEACH'S STORM PETREL	66	144	302	75	49	636
WILSON'S STORM PETREL	10	292	0	0	0	302
LEACH'S or WILSON'S S. P.	25	67	167	0	0	259
WHITE BELLY STORM PETREL	0	8	0	0	0	8
GALAPAGOS STORM PETREL	1	1	0	0	0	2
SOOTY STORM PETREL	2	9	40	4	2	57
WHITE THROATED BOOBY STORM PETREL	0	0	0	1	0	1
HORNBY'S STORM PETREL	0	8	0	9	3	20
SOOTY or BULLOCK'S S. P.	0	3	0	4	0	7
UNID STORM PETREL	1	0	1	0	1	3
COOK PETREL	0	1	0	0	0	1
UNID. GADFLY PETREL	0	14	0	3	0	17
CAPE PIGEON; PINTADO PETREL	0	105	0	16	0	121
GREAT FRIGATE BIRD	15	1	1010	0	0	1026
LESSER FRIGATE BIRD	0	1	0	0	0	1
UNID FRIGATE BIRD	0	76	37	2	141	256
COMMON NODDY	0	0	50	0	0	50
FAIRY TERN	0	0	50	0	0	50
ROYAL? CASPIAN? CRESTED? TERN	0	0	0	1	0	1
UNID. TERN	1	22	0	0	14	37
UNID. TROPIC BIRD	0	1	0	0	0	1
BROWN? PELICAN	0	20	0	0	203	223
UNID GULL CHILEAN PELICAN	0 2	0 0	0	2	0	2
KITTYWAKE GULL	0	35	0	0	0	35
FRANKLIN'S GULL	0	120	0	0	0	120
SOOTY SHEARWATER	0	124 96	0	0	0	124 96
WEDGE TAIL? SHEARWATER	0	5	2	3	2	12
NEWELL'S SHEARWATER	0	0	0	0	42	42
UNID SHEARWATER	0	0	0	0	4	4
FULMER (UNID)	0	1	0	0	0	1
UNID. ALBATROSS	0	3	0	0	0	3
NORTHERN PHALAROPE	0	9	5	7	100	121
PARASITIC? JAEGER	0	0	15	0	0	15
UNID JAEGER	0	0	10	0	0	10

EASTROPAC - CGC ROCKAWAY
AUGUST - SEPTEMBER 1967
TOTAL # BIRDS BY SPECIES BY AREA

	AREA 1	2	3	4	5	TOTAL # / SPECIES
SNOWY EGRET	0	0	1	0	0	1
WHITE EGRET (UNID)	0	15	0	0	0	15
SANDPIPER & SANDERLING	0	0	3	0	0	3
UNID. SANDPIPER	0	0	0	0	1	1
DUNLIN	0	0	0	0	2	2
WHIMBREL	0	0	1	0	0	1
UNID SEABIRD	0	3	0	0	0	3
CLIFF SWALLOW	0	0	3	0	0	3
UNID FLYCATCHERS	0	0	1	0	0	1
UNID WOOD PEWEE & PHOEBE	0	0	3	0	0	3
EASTERN KINGBIRD	0	0	0	0	2	2
UNID WARBLER	0	0	0	0	1	1
UNID DUCKS	0	0	0	0	8	8
TOTAL # BIRDS / AREA	151	1106	3050	129	734	5170 TOTAL # BIRDS SEEN DURING SURVEY

AREA 1

EASTROPAC - CGC ROCKAWAY

AUG 1 - AUG 5 1967

AUG

1

2

3

4

5

TOTAL NO.

SPECIES/AREA

BROWN BOOBY

30

30

BLUE FAKED BOOBY

1

1

LEACH'S STORM PETREL

5

20

17

24

66

WILSON'S STORM PETREL

10

10

WILSON'S or LEACH'S SP

25

25

GALAPAGOS STORM PETREL

1

1

SOOTY STORM PETREL

2

2

UNID. STORM PETREL

1

1

GREAT FRIGATE BIRD

15

15

UNID. TERN

1

1

TOTAL NO.

60

0

20

44

28

152

TOTAL * BIRDS / AREA

BIRDS OBS/DAY

AREA 2 EASTROPAC - CGC ROCKAWAY
6-24 AUG 1967

	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
BROWN BOOBY		15			15			10												40
PERUVIAN BOOBY																				
BLUE FACED BOOBY					5						1									6
LEACH'S STORM PETREL	15	25											1		33	26	15	25	4	144
WILSON'S STORM PETREL					20	2		15			30	25	2	1	1	1	15			292
WILSON'S or LEACH'S S.P.						40	10						1				15	1		67
WHITE BELLY STORM PETREL													2	1	1	4				8
GALAPAGOS STORM PETREL					1															1
SOOTY STORM PETREL	2				2								1	2			2			9
HORNBY'S STORM PETREL					1		3									1	3			8
BULWER'S or SOOTY S.P.													1	1			1			3
COOK PETREL								1												1
UNID GADFLY PETREL					2	10	2													14
GREAT FRIGATE BIRD																		1		1
LESSER FRIGATE BIRD																		1		1
UNID. FRIGATE BIRD		75																1		76
UNID. TERN					2						20									22
UNID TROPIC BIRD	1																			1
CAPE PIGEON (PINTADO PETREL)		20			30	15	5				5	3	1	5	1	10	4	6		105
BROWN? PELICANS		20																		20
KITTYWAKE GULL											35									35
FRANKLIN'S GULL		100									20									120
UNID. WHITE EGRET		15																		15
WEDGE TAIL SHEARWATER																				
SOOTY SHEARWATER								6			90									96
FULMER											1									1
ALBATROSS (UNID.)															2		1			3
NORTHERN PHALAROPE																	9			9
UNID. SEA BIRD							2	1												3
TOTAL NO. BIRDS OBS/DAY	18	270	0	0	260	65	22	33	0	0	202	33	5	11	38	41	24	76	8	1106

TOTAL
BIRDS
AREA

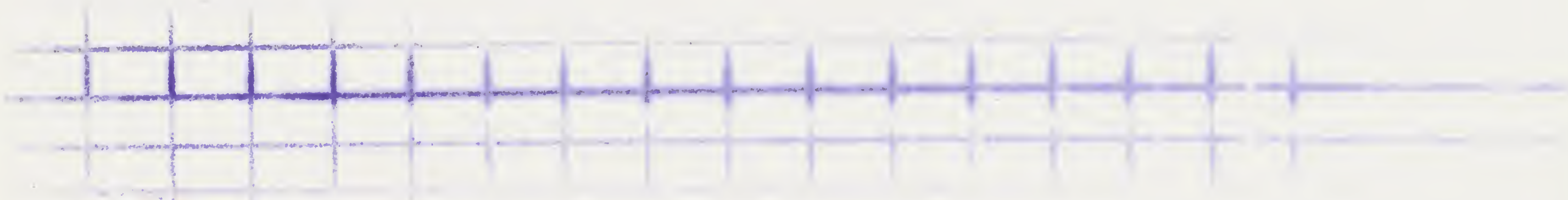
AREA 3 EASTROPAG - CGC ROCKAWAY

25 AUG - 5 SEPT 1967

	AUG							SEPT					TOTAL # SPECIES PER AREA
	25	26	27	28	29	30	31	1	2	3	4	5	
BROWN BOOBY			5						1	300			306
RED FOOTED BOOBY	8							9	2	1000	20	1	1040
UNID. BOOBY			2										2
BLUE FACED BOOBY								1					1
LEACH'S STORM PETREL	6	10	225				2	50	5		2	2	302
WILSON'S STORM PETREL			2	150				15					167
SOOTY WHITE-BELLIED STORM P.							25	12	2		1		40
UNID STORM PETREL	1												1
GREAT FRIGATE BIRDS										1000			1010
UNID FRIGATE BIRDS	23	1									13		37
COMMON NODDY TERN										50			50
FAIRY TERN										50			50
WEDGETAIL? SOOTY SHEARWATER											1	1	2
NORTHERN PHALAROPE							4	1					5
PARASITIC? JAEGER											15		15
UNID. JAEGER											10		10
SNOWY EGRET			1										1
SANDERLING or SANDPIPER			1							2			3
WHIMBREL										1			1
CLIFF SWALLOW									3				3
FLYCATCHER								1					1
PHOEBE or WOOD PEEWEE							3						3
TOTAL NO. BIRDS/DAY	38	11	236	150	0	0	34	89	13	2413	62	4	3050 TOTAL # BIRDS/AREA

AREA 4 EASTROPAC - CGC ROCKAWAY
6-18 SEPTEMBER 1967

	6	7	8	9	10	11	12	13	14	15	16	17	18	TOTAL # BIRDS PER AREA
BLUE FACED BOOBY							1							1
UNID. BOOBY												1		1
LEACH'S STORM PETREL	1	21	21							1	10	11	10	75
WHITE THROATED STORM P. LEACH'S & WILSON'S S.P.						1								1
SOOTY STORM PETREL	1	1										2		4
HORNBY'S STORM PETREL		3	1	1						1	3			9
BULLER'S SOOTY S.P.				1	1			1		1				4
UNID. GADFLY PETREL												3		3
UNID. FRIGATE BIRD								1		1				2
ROYAL, CASPIAN, & CRESTED TERN												1		1
CAPE PIGEON (ANTARCTIC PETREL)	1	3	2	2	1		2	2		1	0	2		16
UNID. GULL												1	1	2
WEDGETAIL? SOOTY SHEARWATER	1								1		1			3
NORTHERN PHALAROPE	4											3		7
TOTAL NO. BIRDS/DAY	8	28	24	4	2	1	3	3	2	4	15	20	15	129
														TOTAL # BIRDS PER AREA



ZONE 1

ZONE 2

ZONE 3

ZONE 4

47001 - 47054

AUG 1 - AUG 5

47055 - 47209

AUG 6 - 24 AUG 67

47210 - 47321

25 AUG - Sept 5

47322 - 47416

6 SEPT - 18 SEPT

ZONE 5

47417 - 47534

19 SEPT - 28 SEPT 67

TOTAL NO/SPECIES/AREA

[illegible]

5166

TURTLES & MAMMALS OBSERVED - EASTROPAC - CGC ROCKAWAY AUGUST - SEPTEMBER 1967

	AUG 9	AUG 10	AUG 27	AUG 28	SEPT 1	SEPT 9	SEPT 22	SEPT 23	SEPT 27	TOTAL # / SPECIES TOTAL # / SPECIES
GREEN TURTLES			2		8		1		8	<u>19</u>
PILOT WHALES		1000				20				1020
SPOTTED DOLPHINS				2				20		22
WHITE BELLED DOLPHIN								1		1
ONID. DOLPHIN	25							1		26
TOTAL NO. MAMMALS / DAY	25	1000	2		20		22			<u>1069</u> TOTAL # MAMMALS SEEN DURING SURVEY